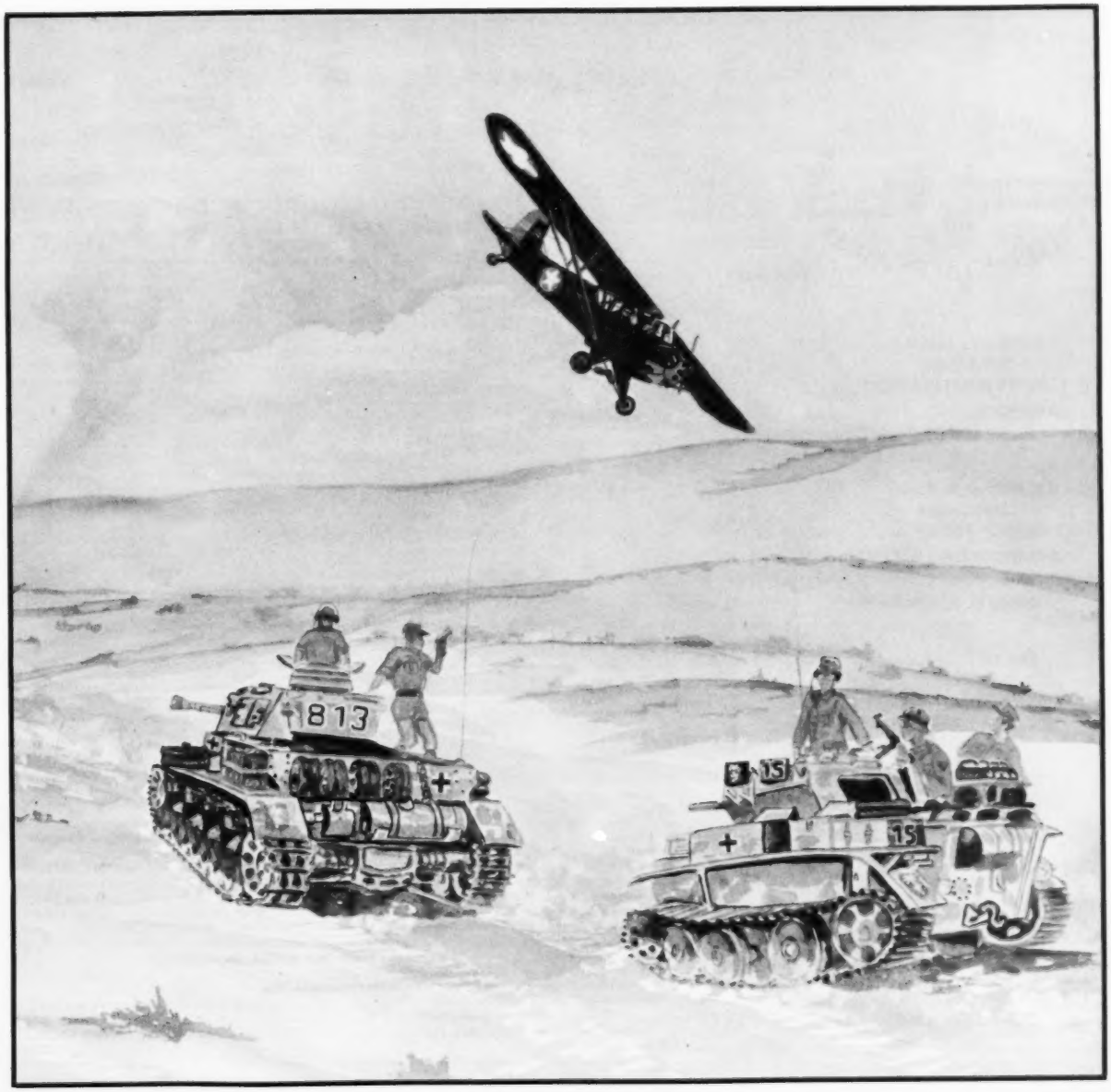
UNITED STATES ARMY

AVIATION DIGEST

JUNE 1975



UNITED STATES ARMY AVIATION DIGEST

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VANGUARD OF FREEDOM
BICENTENNIAL 1775-1975
UNITED STATES ARMY

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A major activity of the
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ABOUT THE COVER

The DIGEST observes the 33rd birthday of Army aviation on 6 June with the cover photograph of combat art depicting reconnaissance of German armor by an L-4 during World War II. The art, by Stephen LeBailly, is on display at the Army Aviation Museum, Ft. Rucker. The artist is a former captain and Army aviator

The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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Articles, photos, and items of interest on Army aviation are invited. Direct communication is authorized to: Editor, U. S. Army Aviation Digest, Fort Rucker, AL 36360.

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200TH ANNIVERSARY OF THE UNITED STATES ARMY

Two hundred years ago on June 14th, 1775, our Army was formed from a small but devoted band of patriots who began the struggle to guarantee the independence and freedom of our people. Out of that struggle our Nation was born. With the same dedication that sparked its birth, the United States Army has always maintained a force ready to protect the liberties of all Americans. For two centuries, it has protected the American people from external threats, and provided the security and stability necessary for peaceful development. It has earned a proud heritage of contribution to the growth and development of America. Today, each soldier stands in the ranks of that long and proud tradition. Our modern Army remains dedicated to the task of preserving peace. On this our 200th Anniversary, let us all join in rededicating ourselves to a third century of service to America.

Howard H. Callaway
Secretary of the Army

Fred C. Weyand
General, United States Army
Chief of Staff

At this time of the Army's bicentennial anniversary, it is especially appropriate to recall the acts of heroism by our most valorous men in uniform—those awarded *The Medal of Honor* . . .

FOR MORE THAN two months in 1971 the Army of the Republic of Vietnam (ARVN) in Military Region II (II Corps) had been engaged with strong North Vietnamese forces for control of commanding terrain extending southeast from Ben Het to Kontum City in Kontum Province. The 52nd Combat Aviation Battalion (CAB) was committed in support of ARVN forces because there were no operational Vietnamese Air Force (VNAF) helicopter squadrons in Military Region II at the time.

The preponderance of utility helicopter support was furnished by the 227th CAB's A Company (Chickenman) which was attached to the 52nd and commanded by Major William E. Adams. His company was reinforced with elements of the 10th CAB, 17th Aviation Group.

Intelligence reports and estimates indicated a concerted enemy assault against the defenses of elements of the 22nd ARVN Division at fire support base (FSB) 5.

On 23 May at approximately 0530 hours, the 28th North Vietnamese Regiment mounted a coordinated attack against FSB 5. The 22nd Division reported 139 enemy killed in action and 11 prisioners of war; west of Dakto, 107 and 122 mm rockets were launched into the 22nd Division Forward Command Post at Tan Canh and Dakto.

Continued heavy fighting on the 23rd required intense resupply efforts by helicopter into the FSB on the 24th. At 1300 hours on the 24th, Stallion 26 (in a UH-1 Huey from the 10th CAB) was shot down while on approach to the FSB. The aircraft crashed on the northern slope of the defensive perimeter. One crew member (the helicopter crewchief) though critically injured, survived. He was rescued by ARVN Soldiers and evacuated to the command bunker on the firebase. The Vietnamese corpsmen administered emergency medical treatment and made available an AN/PRC-25 radio for the crewchief to communicate with the U.S. advisors and myself at the Forward Command Post (CP). It was apparent from the crewchief's radio transmissions that sophisticated medical attention was urgently needed.

Later that day my Battalion S-3, Major (then Captain) George Heard, coordinated a fire support plan with the U.S. advisors at the 22nd ARVN Division Forward CP. This fire support plan with coordinated tactical air support was intended to neutralize enemy automatic weapons emplacements around the firebase and along an approach/departure corridor for the emergency extraction on 25 May of the injured crewchief and two other wounded Soldiers.

Chickenman-6 had been working the Dakto-Tan Canh-Ben Het area of operations for an extended period and the aviators had full knowledge and appreciation of the terrain. Major William E. Adams volunteered for the mission of effecting the rescue on 25 May, weather permitting.

Major Adams, with elements of his 1st Platoon commanded by Captain John D. Curran, assembled his men at Dakto airstrip on the morning of 25 May. Coordination was finalized with the AH-1 HueyCobra gunship support to be provided by the 361st Aerial Weapons Company and the 57th Assault Helicopter Company.

Adverse weather delayed the artillery preparation and tactical air support until about 0900 hours. Once initiated, tactical air from the VNAF 72nd Air Group struck target areas to the north, east and west of the firebase and ARVN artillery from three locations concentrated fire down the northern slope along the flight corridor.

Voluntarily, Major Adams, Captain Curran and their crewmen accepted the mission and lifted off Dakto at about 1210 hours joining their escort gunships for the mercy mission. Major Adams approached to the south and at 600 meters from touchdown began taking heavy automatic weapons fire from positions along the north and west quadrants. Undaunted by the fusillade, he continued his approach determined to accomplish the mission. He successfully maneuvered into the helipad and took aboard the injured crewchief and a wounded ARVN battalion executive officer.

Suddenly, indirect fire began impacting all around the helipad. Knowing the danger, Major Adams courageously began a departure to the north for return to Dakto. His flight corridor literally erupted in a blaze of muzzle flashes from enemy weapons positions. He calmly and collectively transmitted to me: "Getting heavy fire" and then there was a blinding explosion in the vicinity of the swashplate assembly or main rotor mast.

The aircraft crashed less than 1,500 meters from Dakto airstrip and all personnel aboard were lost.

Major Adams' untimely death typified his outstanding leadership qualities. He never demanded from his men but led by example and always gave more than he asked. In this case he gave his life in a gallant effort to save a fellow Soldier.

Major Adams was posthumously awarded the Medal of Honor in August 1974.

Major William E. Adams

Dak to Valor

LTC Russell D. Nelson

Director, Technical Research and Applications
U. S. Army Agency for Aviation Safety

. . . those special few who have put God and country above all else. Men like this represent freedom — they represent *The United States of America.* We are grateful

I FIRST MET Warrant Officer Louis R. Rocco in Phuoc Vinh, Republic of Vietnam. Then a Sergeant First Class, Rocco was a real contributor—the type of supervisor who could *think*. Appropriately, he was assigned as an advisor to an Army of the Republic of Vietnam (ARVN) medical battalion. My unit was the 15th Medical Battalion, 1st Air Cavalry Division.

SGT Rocco enjoyed talking shop with other Americans and visited us quite frequently to establish a closer liaison. He was a conscientious worker striving to learn our techniques so that he could train his unit and not slow our extraction efforts when we picked up the wounded.

Although SGT Rocco was an advisor to a medical battalion, he was not "in the action" enough, so he sometimes replaced my medic and flew with Medevac 2—or The Wild Deuce—as referred to by the units we served.

On 1 May 1970, when the Cambodian incursion began, I was sent to a Special Forces outpost to provide closer support to the incursion task force. I was assigned to support the 25th Infantry and the 1st Cavalry Division. After two weeks SGT Rocco's ARVN battalion moved in to support the ARVN companies working in the area.

Everything broke loose on about the 20th of May and for three days Medevac 2 was kept busy hustling wounded Americans back to the Special Forces camp. On the 23rd of May, I had to "chop down a tree" to extract a wounded American and then fly back to Phuoc Vinh to get a new set of rotor blades for my UH-1H. While I was at Phuoc Vinh, SGT Rocco dropped by and asked for a ride to the Special Forces camp with me. I agreed to take him.

En route the next morning, Medevac Delta (medevac base operations at the Special Forces camp) called in an urgent mission to extract several critically wounded men from one of the companies to which SGT Rocco was as advisor. SGT Rocco said that he would like to go along to help my medic. I agreed.

We flew into the Special Forces camp, offloaded supplies, picked up an extra chicken plate for SGT Rocco and took off. Upon arriving at the pickup site, two AH-1 HueyCobra gunbirds (Precise Swords 12 and Precise Swords 12A) made contact and were ready to give me the necessary firepower being full of nails and rockets (flechette and high explosive 2.75 inch rockets). After getting a briefing from the ground troops, I picked my approach direction, coordinated with the gunbirds and proceeded to make a high speed, low altitude approach to the LZ (landing zone). We began taking light machinegun fire; Precise Swords 12 returned the fire as I flared the ship for touchdown. Two slugs hit my chicken plate and a third hit my knee. Upon landing, my copilot, LT Cauberreaux, looked to me in jest to tell me I'd landed rather hard—then he realized I was hit. Immediately he took command and decided to "get outta there." Pulling pitch he yelled to the gunships that we were getting out. Suddenly, the entire ridge line opened fire. I noticed our rpm (revolutions per minute) going past 5,500 and reached out to key the mike for a Mayday—"The Wild Deuce is going down, XU-5606, MAYDAY XU-5606!"

The tail boom flew away from the ship and we dropped about 50 feet to the ground; the tanks of the ship burst into flames. SGT Rocco, I guess, was thrown from the aircraft which was on its right side in full blaze. I unhooked my seat belts as SGT Rocco came clambering into the ship and bodily threw me through the shattered windshield; he then assisted LT Cauberreaux from the aircraft and returned a third time to pull my wounded medic from the fire. (One of my gunners also had been thrown free of the crash and knocked unconscious.)

SGT Rocco, realizing we were still short one man, returned to the raging inferno but could not find the other gunner who was pinned beneath the aircraft. The two gunships continued their runs against the enemy positions in an attempt to provide us cover. SGT Rocco began shuttling us to cover because the North Vietnamese Army (NVA) battalion was still pouring automatic weapons fire toward us.

I tried to run but my legs wouldn't function so SGT Rocco half-shoved, half-dragged me to the tree line and then returned to help the others. As he was leading LT Cauberreaux to cover, two enemy bullets ripped across Cauberreaux' chicken plate. SGT Rocco had led us to safety with a broken hip and wrist; additionally, while extracting the crewmen from the wreckage he had sustained severe burns on his hands. Disregarding excruciating pain, he continued to administer first aid to his wounded comrades until his wounds and burns caused him to collapse and lose consciousness.

As stated in Warrant Officer Rocco's citation for the Medal of Honor, "His bravery under fire and intense devotion to duty were directly responsible for saving three of his fellow Soldiers from certain death."

Warrant Officer Louis R. Rocco

Medevac Meadow

CPT Stephen F. Modica, U. S. Army Retired

Practice touchdown autorotations are credited with saving lives and equipment. They are also identified as agents responsible for major accidents and injuries. Are they really beneficial or should they be abolished? How do Army pilots feel about this matter? What is DA's policy concerning it, how did it come about and what is it designed to accomplish?

Prepared by
The U. S. Army Agency for Aviation Safety
in cooperation with Deputy for Standardization
U. S. Army Aviation Center

THE GREAT DEBATE

USAAAVS

"TO BE OR NOT TO BE?" That was the question Shakespeare's Hamlet had to wrestle with. Recently, the same question was asked with respect to practice touchdown autorotations – should they be continued or abolished? Some felt the "vaccination" posed a greater threat to the patient's health than the disease. Others embraced the opposite viewpoint. Each side mustered strength and support as it armed itself with factual data. Strangely enough, these were not two opposing factions gearing for battle. On the contrary, they represented members of the same team, mutually seeking answers that would enhance Army aviation safety.

The controversy reached a climax early in October 1974 when the U.S. Army Forces Command (FORSCOM) informed Headquarters, Department of the Army (HQDA), that based on its mishap experience," . . . It is this command's conclusion that the requirement to routinely practice touchdown autorotations during annual standardization flight evaluation is not in the best interest of the Army . . ." FORSCOM went on to recommend that HQDA delete the requirement for pilots to demonstrate proficiency in the performance of touchdown autorotations during annual standardization flight; require pilots to demonstrate proficiency by terminating autorotations with power; and require the IP or SIP to demonstrate one practice touchdown autorotation during every annual standardization flight evaluation, with the pilot following through on the controls.

A look at FORSCOM's mishap experience readily shows the basis for these recommendations. During FY 1974, FORSCOM reported a total of 28 accidents. Of these, 25 percent (7) occurred because of practice touchdown autorotations. These resulted in two injuries and damage costs of almost half a million dollars. Then, during the first quarter of FY 1975, FORSCOM reported 12 accidents. Again, 25 percent (3) resulted from the practice maneuver. Coordinating informally with other services, FORSCOM learned the following: The Navy normally prohibits practice touchdown autorotations outside the pilot training (school) environment. The Marine Corps restricts performance of this maneuver by individual aviators; and when an autorotation is to be demonstrated, it is performed with an experienced and proficient IP at one set of controls. Within the Air Force, it is the major command's prerogative to determine if practice touchdown autorotations will be performed.

Certainly FORSCOM's conclusion and recommendations were based on valid observations and merited serious consideration. If, in fact, their accident experience was representative of experience worldwide, a change in policy might very well be in order. HQDA promptly requested the U.S. Army Aviation Center (USAAVNC) to study the matter and submit any recommendations for changes to DA policy deemed necessary. In addition, the U.S. Army Agency for Aviation Safety (USAAAVS) was tasked with providing pertinent data and coordinating findings and recommendations with the Center.

All touchdown autorotation mishap experience for fiscal years 1971 through 1974 was researched, and applicable data involving UH-1 series, OH-58, T/AH-1G and OH-6 aircraft were collected and assembled for analysis. Since the sole purpose of autorotation training is to enable pilots to cope with in-flight emergencies, the study was oriented towards the requirements for such training as indicated by aircraft reliability; training effectiveness, as reflected by successful and unsuccessful autorotations; and costs for accidents resulting from practice touchdown autorotations.

During this 4-year period, aircraft reliability showed a marked improvement. However, this increase in reliability was due primarily to the exceptional performance of the UH-1 which in FY 1974 was involved in only 7.1 in-flight emergencies per 100,000

(continued on page 30)

On Army aviation's 32nd birthday last year, the Army Aviation Hall of Fame was dedicated and the first seven members were inducted. The AVIATION DIGEST has featured each of these during the intervening year. On the 14th of this month, seven more will be inducted. The DIGEST will continue its Hall of Fame coverage with a biography on each new inductee

LTG Harry W. O. Kinnard
(When he was a Major General)

ARMY AVIATION HALL OF FAME

LIEUTENANT GENERAL Harry W. O. Kinnard was rated an Army aviator in 1962 and was a seasoned authority in airborne operations before he became involved with and applied his experience to the testing of airmobility concepts. Under his command and leadership, the 11th Air Assault Division (Test) was formed in 1963 and established the superiority of airmobility in maneuvers against the 82nd Airborne Division. Subsequently, he formed the Army's first airmobile division, the 1st Cavalry Division (Airmobile), primarily from assets of his test division. From this organization, which provided the Army's first large scale airmobility capabilities, came the aviation techniques, tactics and doctrine which have been adopted throughout the U. S. Army. He deployed this newly formed division to the Kepublic of Vietnam where it was immediately committed to combat and continued to confirm its intrinsic value on a daily basis. Employing highly innovative techniques and ideas which emphasized the use of aerial rocket artillery, rappelling from helicopters, night vision equipment, and the refuel-rearm point system, the division demonstrated the value of the combined arms-helicopter team in several significant and victorious campaigns. Later as the commander of the U.S. Army Combat Developments Command, LTG Kinnard extended airmobility doctrine and contributed materially to the refinement of air assult operations before retiring in 1969.

Logistical Support of Army Aircraft: Time for a

CHANGE

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HOW MANY TIMES have you heard your aviation maintenance officer say to your unit operations officer, "Listen to reason John! If I can't get the tools, parts or maintenance support to fix 'em, you can't fly 'em!"?

How many times have you gone to your unit supply officer to direct exchange (DX) a set of Nomex only to hear him say, "Gee, I'd sure like to help you but we're out and I don't know when we'll get any more in."?

Undoubtedly you have heard your technical supply officer say, "I have to scrounge everything we need and you guys just don't appreciate it!"

These are only a few of the reasons why the supply support structure for Army aircraft, aircraft systems components and aviation unique and/or managed items of equipment are undergoing extensive study for possible revisions in doctrine and application.

Peacetime supply support doctrine and wartime supply support doctrine have historically borne little resemblance to each other. Peacetime doctrine is shadowed by manpower reductions, budgetary restraints and an overall lack of a sense of urgency, while wartime doctrine is amplified by a "whatever it takes to get the job done" attitude. However, these factors alone do not a supply system make.

During the first stages of the war in the Republic of Vietnam it was recognized that the then present system for logistical support of aviation was incapable of supporting a theater of operations which relied so heavily on Army aircraft. This was due, primarily, to a lack of centralized control over aviation materiel and a supply and maintenance structure that was unable to stay in step with the rapidly increasing number of aircraft and their supply and maintenance requirements.

From this recognition of a need for change, a general support group for aviation maintenance and supply was formed. This group was to provide a commodity oriented and vertical management structure that would achieve the goal of providing one-stop support to its customers. The idea was to reduce the number of different channels an aviation unit had to rely on for total support of its aircraft and thus increase availability by intensively managing aviation materiel and maintenance assets.

EDITOR'S NOTE: In the July issue of the DIGEST, the U.S. Army Transportation School will take a more current look at this subject, as well as reserve component training, new materiel developments and the current status of the MOS 67 career management field (CMF) development.

The results, after the implementation of this system, soon surfaced. Demand accommodation and demand satisfaction rates for requisitions began to rise while not operationally ready supply (NORS) rates and order ship time (OST) rates decreased, both resulting in higher availability rates for aircraft.

This type of commodity oriented maintenance and supply structure proved successful even though it was in contravention to the then present doctrine. However, we must remember that this era consisted of the "whatever it takes to get the job done" attitude which did not impose a large number of restraints for the implementation of a workable system.

Based on experience in Vietnam, conceptual and doctrinal changes in aircraft maintenance have emerged. Some of these changes are in the field, while others are still being studied, tested and evaluated. Such changes, and coming changes, are:

- IDSM (integrated direct support maintenance) which is incorporated into aviation units having a large number of aircraft to support.
- The three-level maintenance concept which has amalgamated direct and general support maintenance providing a single intermediate maintenance facility between the aviation unit and the depot.
- Project Inspect which is considering the feasibility of extending inspection requirements on various types of aircraft.
- CONAM (concept of night aircraft maintenance) which is studying the possibility of performing maintenance on aircraft using minimum lighting at night.
- And SAMS (standard Army maintenance system) which is envisioned as a maintenance management system responsive to each of the various levels of command.

On the supply side of the logistical house there are also changes in the mill. A few such innovations are:

- Direct support system (DSS) which, in peacetime is designed to deliver repair parts directly to direct and general support units. (DSS has been in use for several years.)
- Direct support unit standard supply system (DS4) which is a fully automated information and management system designed to operate at the retail level of supply.
- Standard Army integrated logistical system (SAILS) which is also an automated information and management system but designed to operate at the intermediate level of supply.

In the area of supply and maintenance amalgamation, the logistics community is presenting the commodity oriented general support (COGS) center and modular oriented direct support (MODS) concepts for scrutiny. Even though these concepts were designed for conventional materiel, there is possible application for their use in aviation as will be shown later in this article. However, alterations are necessary because aviation maintenance and supply are not treated in the same manner as is conventional materiel.

There are two other concepts that will impact on the total logistics picture. These are the echelons above division (EAD) concept which already has been approved, and the EAD expanded concept which still is being studied.

The EAD concept was designed to eliminate unnecessary layering and duplication in upper level command functions. This resulted in the elimination of the Field Army Support Command (FASCOM) and has subsequently led to the merger of the Theater Army Headquarters (TA HQ) with the

Theater Army Support Command Headquarters (TASCOM HQ).

The EAD expanded concept recommends the elimination of the Materiel Command (MATCOM) with its subordinate depot system, and the Theater Army Support Command (TASCOM). This would result in the decentralization of supply and maintenance function to the Theater Army Area Command (TAACOM) support groups, and centralize management of controlled items only at the TA HQ.

In light of the above-mentioned concepts and others not mentioned, the U. S. Army Transportation School at Fort Eustis, VA is conducting a study entitled "Transportation Aircraft Supply Support Structure" (TAS_3). This study is proposing an aircraft supply support structure that is systems oriented and possesses an intermediate distribution point between Continental United States (CONUS) depots and aviation related units. However, this study encompasses more than one might think if judging from the brief description just given. TAS_3 hopes to produce a system that will provide:

- A structure that is viable in peacetime, wartime and the transition period between the two;
- A structure that will provide TOE (table of organization and equipment) staffing for missions that have only been implied missions in the past, e.g., assembly and retrograde of aircraft;
- A structure that will provide not only commodity oriented support in the area of aviation related class IX supplies (repair parts), but in aviation related class II (tools and clothing), and aviation related class VII (major end items) supplies as well;
- A structure that will fill voids in aviation supply support that will be created by the implementation of impending doctrinal changes;
- A structure that will fill voids in present aviation supply support doctrine;
- And a structure that will interface with emerging automated supply and maintenance management concepts.

The TAS_3 study is considering the feasibility of forming an aviation support center that is in line with the COGS center concept. This center would be located in the corps and would be under the control of the Corps Support Command (COSCOM). The aviation support center would consist of the following elements:

- One or more AVIMs: An AVIM (aviation intermediate maintenance) being a company which will provide direct support/general support (DS/GS) supply and maintenance to its customers. The AVIMs will support divisional maintenance units on a designated basis and nondivisional aviation units on an area basis.
- One TAS: A TAS being a transportation aircraft support company. The TAS will be located at or near a major airfield and will provide fuel and oil analysis, an aircraft component collection point, an aircraft assembly and retrograde point and an aviation supply point. The aviation supply point will handle all aviation related classes II, VII and IX supplies.
- An air transport element: The air transport element will provide a distribution and evacuation capability to the center. However, the aviation support center will not be fixed in size as is a conventional maintenance battalion. Instead, it will be tailorable in that its size will be determined by the number of aviation units that it will be required to support. This capability will be achieved through modular design, which is in line with the MODS concept, with the ability of adding or deleting modules as the need arises. For example: If the AVIM is not required to support CH-47 Chinooks or CH-54 Cranes, then its aircraft maintenance branch will not contain these sections. If the corps requirements are relatively small (e.g., during peacetime) perhaps an air transport section would not be needed at all, in which case the corps movements control center (MCC) would be tasked with the transportation mission. The size of the various elements of the TAS also can be regulated by adding or subtracting teams based on workloads, the number of supply line items to be maintained, and the number of supply transactions that take place.

The aviation support center is envisioned as a single channel for aviation maintenance and supply support. The maintenance officer would receive better maintenance support, the technical supply officer would receive better demand accommodation and demand satisfaction on requisitions and the aviator would receive better support in the area of flight equipment and survival gear.

The time for change is now while we are in a peacetime environment and not later when we may be engaged in another war; but, we must not allow restraints to totally govern or shadow our doctrinal changes. We should temper these restraints with the concern for success that is contained in the "whatever it takes to get the job done" attitude and devise the best system possible to meet the needs of the service.

Captain Roy P. Oler is currently working on the conceptual study "Transportation Aircraft Supply Support Structure" (TAS_3) at the U. S. Army Transportation School, Fort Eustis, VA. He has a B. S. degree in Education

employment of an AIRBORNE COMMAND POST in a high threat environment

CPT Joseph T. Tison
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Fort Rucker

DURING THE VIETNAM War, we witnessed the emergence of the command and control helicopter. In the early years of that war, commanders jury-rigged radios in helicopters to act as airborne command posts from which they could observe and influence the battle. The capability for firsthand observation of the battlefield was enjoyed to a higher degree than ever before in the history of warfare. This was due largely to the expanded use of the helicopter and the absence of sophisticated antiaircraft weapons which allowed commanders to remain directly over the scene of battle.

Recognizing the potential offered by the helicopter in this environment, General William Westmoreland, American commander in the Republic of Vietnam, in July 1964 requested that a heliborne command post communications console be developed. The additional radios available through the new communications consoles further facilitated control, making the command and control (C&C) aircraft a valuable and effective innovation of the Vietnam War. However, little thought was given to command and control helicopter tactics. Premission planning for employment of the C&C aircraft usually involved nothing more than selecting an altitude that would provide vertical separation from other aircraft in the area of operations and deciding whether to use right- or left-hand orbits.

Recognizing that airmobile and air assault operations are here to stay, the survivability of the helicopter on the modern battlefield has been a matter of much thought, planning and development throughout the Army. Obviously, conditions in future wars will not allow commanders to observe battles from remote sanctums 2,500 feet above the ground. Command and control helicopters employed in a high threat environment must use specific tactics to survive. Before discussing these tactics, it might be wise to define the following:

High threat environment: An enemy combat posture wherein modern, sophisticated weapons and techniques create a highly lethal situation with the intention of establishing control over territory and airspace contiguous to that territory. Such a posture could include armor, field and antiaircraft artillery, surface-to-air missiles and tactical fighters which would be directed by radar, infrared, optical, electro-optical and visual means, and might be supplemented by electronic warfare methods to include jamming and deception.

Terrain flying: The tactic of flying in such a manner as to utilize terrain, vegetation and man-made objects to enhance survivability by degrading the enemy's ability to visually, optically or electronically detect or locate the aircraft. This tactic involves a constant awareness of the capabilities and position of enemy weapons and detection means in relation to available masking terrain features and flight routes. Terrain flying of necessity involves flight close to the earth's surface and includes the tactical application of low level, contour and nap-of-the-earth (NOE) flight techniques as appropriate to counter the enemy's capability to acquire, track and engage the aircraft.

Command and control: The exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of his mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities and procedures which are employed by a commander in planning, directing, coordinating and controlling forces and operations in the accomplishment of his mission (AR 310-25).

Airborne command post: A suitably equipped aircraft used by the commander for the control of his forces (AR 310-25). FM 57-23, *"Airmobile Operations,"* labels the command and control aircraft as the airborne command post. Hereafter, it will be referred to by that title.

Helicopter operations in a high threat environment will be confined to terrain flying levels to minimize exposure to enemy antiaircraft weapons and electronic warfare procedures. Since flight at these levels will limit observation and communications, the question of whether an aircraft operating at terrain levels can effectively function as an airborne command post is one that warrants discussion.

The requirement for command observation and presence is the basic consideration for employing an airborne command post in a high threat environment. Although decentralizing control to the lowest echelons of command will minimize this requirement, there remains a valid need for airborne command posts during airmobile and air assault operations. These operations present unique command and control problems, especially during the initial assault phase where operations may cover extended distances and require rapid communications between major force elements. The airborne command post would allow the commander to move about the operational area without restrictions due to terrain and thus maintain close command and control of his forces.

A feasible solution for employing an airborne command post in a high threat environment would be to have the airborne command post accompany an element of the airmobile force to the objective area. This would preserve the surprise and shock action of the attack and place the commander in a position to observe the action and make timely decisions. This tactic would make use of suppressive fires from artillery and close air support to reduce the probability of encountering threat weapons along the route of flight and in the landing zone (LZ).

Once in the area of the objective, the airborne command post would move to alternate positions to observe and communicate with assault elements, always using terrain as a mask from detection and engagement by enemy weapons. To minimize exposure to enemy weapons, the aircraft would use popup techniques to observe the activity on the LZ. After the assault force is established on the ground, the airborne command post could remain masked until the situation dictated command presence, then move at terrain flying levels directly to the scene of battle. Information concerning positions advantageous to command and control could be furnished by aerial scouts. The airborne command post must use positions that offer maximum cover and concealment since the volume of radio transmissions inherent in command and control would make it especially susceptible to electronic detection and jamming.

Continuous operations in the area of the forward edge of the battle area (FEBA) will require that an airborne command post skillfully employ all the techniques of terrain flying as well as make maximum use of the combined arms team support and suppressive fire weapons systems. Contingency plans must include provisions for allowing the command post to be transferred to a forward location on the ground in event the enemy antiaircraft or electronic warfare capabilities have not been successfully suppressed. In this situation, the airborne command post would remain in a rear holding area until the threat had been suppressed and the tactical situation warranted airborne command observation and presence.

There is nothing new to be found in the above. Army aviators are aware of the threat that will exist on battlefields of the future. But in spite of this threat, aviators operating within the mission commander's scheme of maneuver are knowledgeable of the combined arms team concept and can apply the techniques of terrain flying in a high threat environment. They will ensure that the advantages which the airborne command post offered commanders in Vietnam are translated into C&C procedures needed on the modern-day battlefield.

IT'S NOT TOO LATE

To Register for the 1975 Annual Aviation Mechanic Safety Awards

ALTHOUGH THE Federal Aviation Administration (FAA) will start compiling and collating entries for the 1975 Annual Aviation Mechanics Safety Awards on 1 July, it is still not too late to register. Entries will be accepted through 31 December 1975.

The FAA established the program in 1963 to give recognition to the aviation mechanics making an outstanding contribution to air safety by maintenance practices. It is open to all active aviation mechanics including those in the Armed Forces.

Fifty awards are made for the general aviation mechanic—one for each state. If a winner is located in Puerto Rico or the Virgin Islands, additional awards are made.

From the general aviation state winners, one award is given in each of the 12 FAA regions. In addition to these, one award per FAA region is given to air carrier mechanics. From the regional winners, two national awards are presented—one air carrier mechanic and one general aviation mechanic.

Three classifications for the selection of winners are considered:

- For the suggestion of a design or improvement to an aircraft or powerplant or any of its components that led to or resulted in increased reliability and/or safety in aviation.
- For the suggestion or development of a maintenance and/or inspection procedure that contributed significantly to safety in aviation.
- For the constant demonstration of high level professionalism and excellence in the performance of his duties as an aviation mechanic that led to or resulted in increased reliability and/or safety in aviation.

Entries for or from aviation mechanics in the Armed Forces must also be applicable to civil aviation use.

The official entry form is FAA Form 1210-1 "Entry For Aviation Mechanic Safety Award" which may be obtained from the local FAA office.

Winners of a state award receive a permanently mounted FAA certificate inscribed with the Department of Transportation seal and citation signed by the FAA administrator.

Regional winners receive a permanently mounted metal plaque engraved with the agency seal and citation signed by the FAA administrator and appropriate regional director.

National award winners receive a cast medallion created for the agency and mounted in an exhibition frame.

All winners are offered a tuition-free resident or correspondence type maintenance training course of their choice originating at the FAA Academy in Oklahoma City, OK. Regional and national winners are enrolled in the Aviation Mechanics Club and are ensured a suitable certificate and associated lapel pin.

State winners in 1975 will receive awards on 5 March 1976 and regional winners on 30 March 1976. National winners will be presented awards on dates scheduled by FAA headquarters, generally during the first six months of the calendar year.

AR 672-2, Decorations, Awards and Honors, National and International Awards, effective 1 May 1975 establishes policies pertaining to awards given by nonfederal organizations.

The AVIATION DIGEST is planning a comprehensive article covering all medals and awards, official and unofficial, available to Army aviators. The article will include eligibility requirements, deadlines and methods of applying. Readers are requested to send information regarding local awards, official or unofficial, not normally included in official government publications to Editor, U. S. ARMY AVIATION DIGEST, P. O. Drawer P, Fort Rucker, AL 36360

FREE

STUDY MATERIAL FOR NON-RESIDENT COURSES OF INSTRUCTION

The Department of Army-Wide Training Support will provide non-resident courses of instruction study material, free of charge, locally or by correspondence, to enrolled eligible members of the Armed Forces, active or reserve and to other authorized personnel

SFC Jack Ehman, Department of Academic Training, U. S. Army Aviation Center, receives his diploma from Major General William J. Maddox Jr. SFC Ehman is the first student to complete the Air Traffic Control Basic and Advanced NCO Correspondence Courses. He enrolled in the ATC Basic Course in June 1974 and completed it in April 1975. He enrolled in the ATC Advanced Course in September 1974 and completed it in April 1975

ELEVEN CAREER AND SKILL DEVELOPMENT COURSES ARE AVAILABLE

- Flight Operations Coordinator Course
- OH-58 Helicopter Repairman Course
- UH-1 Helicopter Repairman Course
- Aircraft Maintenance Entry Course
- Flight Training Preparatory Course
- Aviation Accident Prevention Management Course
- Army Aviation Command and Staff Course
- Warrant Officer Senior Course
- Aviation Warrant Officer Advanced Course
- ATC NCO Basic Course
- ATC NCO Advanced Course

Individual subcourses also are available

ONLY THREE THINGS TO DO

1. **Complete one copy of DA Form 145, Army Correspondence Course Enrollment Application.**
2. **Submit completed DA Form 145 to your commander for indorsement.**
3. **Forward the completed application to: Department of Army-Wide Training Support, U. S. Army Aviation Center, P. O. Box J, Fort Rucker, AL 36360.**

TWISTER

CW2 Joseph L. Bradley Jr.

Evacuation Pilot
82nd Medical Detachment
(Helicopter Ambulance)
Fort Riley, KA

WHEN MOST OF Fort Riley's aviators are leaving work, returning home after shuffling papers, administering to unit duties or flying various assigned missions, there remains a crew around the clock at the 82nd Medical Detachment. They also would not mind going home to a warm meal or stopping at the club for a cold one. Their job is to wait, and wait they must, for they may be needed as they were one day in September 1973.

I was driving home with visions of steak dancing in my head. Although I was the second-up copilot, I had a 30-minute period in which to return to the airfield if I was needed to fly. The necessity of my availability along with several other crews became

apparent all too soon.

About 45 minutes after a normal duty day, the unit was notified that a "twister" had completely obliterated a 40-unit trailer park in Salina, KA. The Kansas Highway Patrol had requested that an evacuation helicopter be sent to the area but had no information on casualties. After approval, first-up was off with our commanding officer (CO) and another pilot in hot pursuit in a second UH-1H Huey aircraft. The helicopters were now on hand if they were needed in the area of destruction. Unit operations alerted all available pilots and crew members and began coordination with civil authorities and our aircraft in the area. Thank God and early warning that the aircraft were not needed for what could have been a terrible and tragic event. The residents of the trailer park had taken refuge in a storm shelter and not one casualty was reported.

The two aircraft now began a systematic search along the tornado's path through the Salina area. No casualties were seen so the aircraft returned to Salina and refueled. Later, these two crews were to view something that is indeed rare.

With the two aircraft airborne once again, the CO decided to depart the area and return to Fort Riley and have the first-up crew return to the tornado's path and follow its northeastern track to search for victims. Then—before the eyes of the CO and his crew—a funnel dropped from low lying clouds north of Interstate 70, near Abilene. They started to give information about the location, heading and approximate speed of the funnel to the Highway Patrol and Flight Service Station (FSS). Subsequently, this information was broadcasted by commercial radio stations to warn the isolated, unsuspecting people in its path. The personnel on duty at Detachment 8, 16th Weather Squadron at Marshall U. S. Army Airfield, Fort Riley, KA, used this information and tracked the cell on their weather radar. The CO's aircraft followed the tornado at a safe standoff distance. With evening darkness now totally obscuring visual search, the base weather radar became the eyes for our mission.

It worked! Word was spread, and none too soon for the people living in Clay Center. The funnel slashed through the middle of the town, scattering debris in a wide pattern of havoc. But most of the people were in areas of safety, thanks to the fast warning. Only a few people were injured and none were killed.

Our ships followed the twister into Clay Center; and, as it left, we landed by the hospital which also had been damaged. Coordinating with the hospital directors and the police, we waited for word to evacuate the injured. That word was slow in coming for most people had found shelter and were not hurt.

The decision was made from survey of the devastation that more assistance would surely be needed. Our second-up crew was called in to deliver an emergency supply of distilled water, plasma and other emergency medical supplies. After loading those supplies aboard our aircraft, we cranked, received clearance and headed for Clay Center. With the aircraft in a "hauling the mail" attitude, flight time to Clay Center was 20 minutes despite extraordinarily turbulent air and strong winds which seemed to change direction every few miles.

The point on the horizon, where Clay Center should have been, was dark as a cave. Navigation was simple. We followed the appropriate outbound radial from Manhattan VOR (very high frequency omnidirectional range) and stayed clear of the ragged edge which was getting worse. Weather detachment personnel had reported new and more violent cells appearing on their scope. Flying became more difficult with the ceiling deteriorating and patches of heavy rain. We increased our instrument lighting to maximum to counter the brilliance of the lightning now seemingly all around us. Our final inbound vectors were given by our crews already in the landing zone. Shooting a steep approach to a totally blacked-out area with a water tower to the right side, a radio transmission tower on the left side, and a strobe light as our target with a 30-knot crosswind and a drizzling rain will put the hair on your neck at razor's edge.

After landing and unloading the needed medical supplies we briefed our detachment personnel on the ground about the worsening weather conditions. We remained on the ground to aid in searching the surrounding area. We then evacuated a patient suffering from shock and a hospital attendant with a fractured arm. Our return to Fort Riley was uneventful.

We refueled, restocked on chewing gum and were off again. Our second trip seemed bumpier yet with winds at 50 knots at 2,100 feet indicated! Impossible! *We soon found out it was not.*

At Clay Center we were amazed at the streams of cars stopped on the road. Hundreds of cars were trying to enter Clay Center to check on people they knew or to sightsee. Although these vehicles were unable to enter the darkened center of the town due to police roadblocks and debris, they did form a perfect "X" which indicated the center of town.

Again we found the strobe and were "talked into an approach." I heard something in my earphones which made me want to crawl under my seat: "Funnel entering

town from the southwest!" Great!

A flash of lightning afforded us scant seconds to scan the horizon for that tube of death. The pilot at the controls was maintaining a 50-knot indicated airspeed at a high hover, at least that is what the airspeed indicator read. It was apparent from my observation, that we were stationary over the strobe light.

The next few seconds were impossible to digest at once. The man holding the strobe light took refuge in a nearby ditch. The wind shifted and the aircraft started to do 360-degree turns, a flash of lightning, the water tower was now 20 yards to our right. *Full power, get away.*

The spinning stopped, "Funnels, there are two funnels!" Another flash of light, my God, there is the radio tower 5 degrees off our nose and 200 feet our superior in altitude! Rain, blinding rain. Turn right to miss the tower. The crewchief and medic almost simultaneously exclaimed, "Funnel at 3 o'clock—funnel at 9 o'clock!"

The bird held together, we held together. "DUSTOFF Six, 484 is going home."

"OK," was the response. With a tremendous tail wind we were home in 10 minutes.

Two crews and readied aircraft remained in Clay Center ready to evacuate seriously injured citizens. Our flying was ended. The four of us quietly sipped 12-hour-old coffee, sweating in the cool air. Questions were swarming in our ears, but we did not hear them. We were home. Fort Riley, KA, never looked so good.

* * * * * * *

There are scores of other accounts that could be rendered from that night and the days that followed. Many Fort Riley personnel risked more than personal discomfort to offer their help to those in need. This was my own personal account and I have thought more than once about it.

I learned many lessons and reinforced many more. This aviator, as all Soldiers, saw that hypothetical point where quality training makes *the* difference between success and failure. *Duty, mission, performance plus training* equated in favor over one's "threshold of fear" to accomplish the essential mission at hand. Training made the crew's reactions to the stimuli both correct and unconsciously reflexive, thus assuring a safe and completed mission.

I reinforced the lessons of correctly adhering to established procedure and policy. In this case it was a thorough weather briefing and preflight, as well as adhering to proper communications procedures. The latter, without which it would not have been possible for Clay Center to communicate to the outside had it not been for aircraft from units of the 1st Aviation Battalion (Prov) in the air, maintaining a radio link via airborne radio.

Contingency plans for rapid deployment of "DUSTOFF" crews and aircraft were used. Mobilization by engineer units and support they needed was rapid and effective. Before daybreak the next morning the engineers were clearing rubble. For the troops conducting ground search, fresh supplies and equipment were rolling into town as needed.

For all these people involved in the effort to help this stricken community and for myself. . .this was just another day's work, *but a good one*!

YAH-63 Begins Ground Runs

After final instrumentation and checkout, Bell Helicopter's ground test YAH-63 has begun ground run tests. The ground test vehicle is the first of three prototypes being built by Bell as their entry in the Army's Advanced Attack Helicopter program

Ship number two, the first flying prototype, is scheduled to fly this summer and number three is in final assembly. After extensive testing, both aircraft will be delivered to the Army for competitive evaluation in May 1976

Helicopter Crew Decorated For Mt. Katahdin Rescue

THE CREW MEMBERS of a helicopter belonging to the 112th Medical Company (Air Ambulance), Maine Army National Guard, have been decorated for their part in the rescue of five stranded mountain climbers from Mt. Katahdin, ME.

The rescue occurred last February during the dead of winter. The crew braved arctic winds and cold to pluck the frostbitten mountain climbers off the treacherous mountainside, thus saving their lives. A sixth climber elected to remain on a ledge and perished.

Major Eugene L. Richardson, commanding officer of the 112th and pilot of the chopper that made numerous missions to rescue the climbers, received the Air Medal from Major General Paul Day. His copilot, Captain Paul W. Wheeler, also received the Air Medal while Staff Sergeant Jay A. Tennant, medical aidman received the Army Commendation Medal. The crewchief, Specialist 6 Edward F. Harvey was also selected to receive the Army Commendation Medal.

In the citations accompanying the award to MAJ Richardson, it was pointed out that all had risked their lives braving temperatures 25 degrees below zero with an almost constant chill factor of 100 degrees below zero. Winds of 70 knots continually buffeted the aircraft making control difficult and hazardous. Approaches to landing zones were made through narrow mountain passes filled with dangerous swirling winds.

The citations also noted that if the rescue mission had not been carried out, the five young men all would have died.

VIEWS FROM READERS

Sir:

Your Army Aviation Hall of Fame tribute to LTG William B. Bunker in the January 1975 issue of the DIGEST has been read with interest.

In addition to being "Father of the Helicopter," GEN Bunker will long be remembered for other contributions he made to the Army. He was an ever-inquisitive intellectual, innovator, administrator, manager, teacher and logistician. As GEN Frank S. Besson, Jr. said in his Bunker Hall dedication ceremony remarks on 21 July 1970 at the U.S. Army Logistics Management Center:

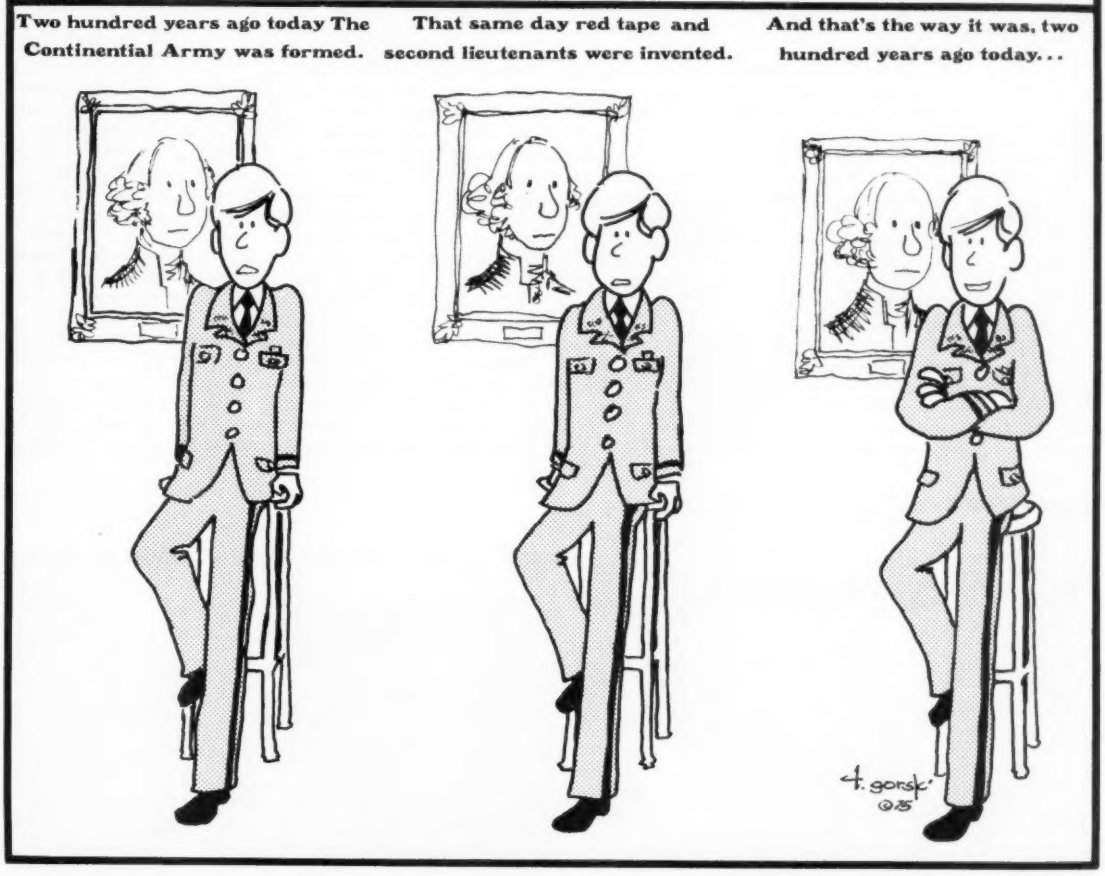
"Throughout his years in AMC—and really always— Bill Bunker had a deep and continuous interest in expanding and improving educational facilities for logistics and management training. The Army Logistics Management Center was one of his prides and joy . . . .

"He was not a man of many words, but he was clearly a man of action with an instant perception, an intuitive grasp, and a basic simplicity which marked all his deeds. He was gifted with a patience to listen, the talent to trust and the drive to decide. These characteristics are his legacy to those who serve in the future . . . ."

We at the Army Logistics Management Center are proud to have our academic building bear the name of Bunker Hall (see below).

COL Don A. Wilkinson
Commandant, U.S. Army
Logistics Management Center
Ft. Lee, VA 23801

gorski's corner


Two hundred years ago today The Continential Army was formed.
That same day red tape and second lieutenants were invented.
And that's the way it was, two hundred years ago today...
t. gorski ©75

Sir:

I have recently been appointed as Director of Alumni Relations for Embry-Riddle Aeronautical University. Embry-Riddle, which was founded in 1926, has more than 50,000 alumni; however, our present records indicate only 7,000 active members. Our 50th anniversary will be in 1976 and we are planning many festivities at the University throughout the year. Interested Embry-Riddle alumni contact the University at the following address:

Director of Alumni Relations
Embry-Riddle Aeronautical University
P.O. Box 2411
Daytona Beach, FL 32015

John E. Rollins
Director of Alumni Relations

Sir:

I have reviewed your article "REPCON" (UNELKO Rain Repellent and Surface Conditioner), Federal stock number 6850-139-5297, and found it quite interesting and beneficial (see Feb 75 DIGEST, page 22).

Could you please advise where and how I may purchase a quantity of this material? Thank you.

SFC ALVIN K. FRITZ (Ret.)
USARNG

• To get additional information about purchasing REPCON, write to:

C.C. Austin Company
3412 Lenox Drive
Dayton, OH 45429

Sir:

We would appreciate it if the following could be listed in your magazine:

12-27 JULY 1975:
National Parachuting Championships
Tahlequah Municipal Airport, OK

For more information contact:
Norman E. Heaton
Executive Director, U.S. Parachute Association
P.O. Box 109
Monterey, CA 93940
Telephone Number: (408) 373-2708

Michael F. Truffer
Director of Special Projects

Dear Sir:

I owe my life to Louis Rocco and to those others who participated in the rescue of my downed crew. Had it not been for the heroics of Sergeant First Class, now Warrant Officer, Louis Rocco, the rescue of Medevac 2 and crew would not have been undertaken.

At 1100 hours on 24 May 1970, Medevac Delta received an urgent medical evacuation request from the Asleep Dumps 52 Charley element of the 9th Army of the Republic of Vietnam (ARVN) Airborne Brigade operating northeast of Katum five miles inside Cambodia.

Medevac 2 answered the request and headed for the pickup zone with two accompanying AH-1 HueyCobra gunships. Medevac 2 was taken under fire on approach and shot down trying to take off. The UH-1H crashed and burst into flames on impact. Because of the heroic actions of SGT Rocco (a volunteer medic aboard the aircraft) the crewmen survived and made it to the safety of the friendly ARVN perimeter. Although surrounded, they were not without help.

One of the Blue Max gunship pilots, LT George Alexander, relayed coordinates and critical information. His call and the previous Mayday resulted in some 15 to 20 aircraft converging on the scene. Three were medevac ships hoping for a chance to rescue their comrades.

The first attempt to extract the wounded was by Medevac 1, LT Henry Tuell, who was forced away from the pickup site by concentrated enemy fire. Although LT Tuell had heavy AH-1 Cobra gunship protection, his ship received innumerable hits and he was wounded in the hand by an enemy bullet. The rescue attempt was aborted and the pilot nursed the battered ship and wounded aircraft commander to Quan Loi.

The second extraction attempt was executed two hours later by Medevac 12, LT John Read. LT Read tried to get into the landing zone (LZ) using a low level, high speed entry with rocket preps by the gunships but had to break off his attempt when the enemy bullets disabled his engine and punctured his fuel cells. The ship was unflyable but LT Read was able to safely land the aircraft in a nearby clearing. He was rescued immediately.

At about 1800 hours on 24 May, after six hours on the ground, we notified Medevac 6 and Sureshot 6 (the medical battalion commander) that the friendlies, in our estimation and in the estimation of the ARVN advisors on the ground, might not be able to hold out through the night because of the lack of ammunition, food and water. The unit had not been resupplied for two days. We advised Sureshot 6 that an armored tank company from the 11th Armored Cavalry Regiment was two miles to the north and requested coordination with the taskforce commander in using them in a rescue attempt. After communicating with the taskforce commander, Sureshot 6 advised us that the tanks could not be released. However, a battery of 155 mm howitzer and a battery of 8-inch guns were assigned to begin a barrage encircling the friendlies.

Following a full one-hour barrage, Medevac 21, CWO Raymond Zepp, accompanied by four heavily armed Cobras attempted the third rescue try. The mercy helicopter was welcomed by heavy small arms fire—the four Cobras returned rockets and mini-gun fire into the tree line. Medevac 21 also had to abort his attempt at rescue due to combat damage to

Sir:

On pages 2 and 13 of the January 1975 issue of AVIATION DIGEST the acronym "AAFIF" is defined as Automated Air Facilities Intelligence File. In fact, it is the Automated Air Facilities Information File (AAFIF).

The AAFIF is produced and maintained by the Defense Mapping Agency Aerospace Center in St. Louis, MO. The AAFIF has existed since 1961 as an integral part of the DoD Free World Air Facility and Flight Information Library. It contains detailed information on operating areas and support facilities on approximately 49,000 airfields in the free world. One of its uses is the updating of the Defense Intelligence Agency's (DIAs) Automated Installation Intelligence File. So that there is no misunderstanding, let it be pointed out that DIA is charged by DoD Directive 5105.21 with the responsibility for developing, producing and providing basic intelligence.

COL Wallace W. Keehr, USAF
Deputy Director for Plans,
Requirements & Technology
Defense Mapping Agency

- **Thank you for calling this error to my attention. I understand that a relatively recent change to regulations changes the word "intelligence" to read "information" in this title to reflect accuracy. Editor.**

Three scenes of drama and action depict the job of medevac rescue crews

his radios and an electrical fire. He made a successful precautionary landing and was rescued immediately. Nightfall approached rapidly and stalled further rescue operations until dawn.

During the night, the friendlies were heavily attacked three times, necessitating the calling of artillery fires extremely close to the friendly perimeter. The artillery barrages and close, well coordinated gunship cover protected the ill-supplied, surrounded friendlies throughout the night, accounting for three very large secondary explosions and 41 confirmed enemy dead.

Commencing at 0930 on 25 May, four successive airstrikes were called in to help weaken enemy resistance. The airstrikes ended at about 1100 hours. The 155 mm battery and the 8-inch battery then began a barrage of white phosphorus (WP) in order to lay a heavy smoke screen for the forthcoming attempt of rescuing the crew of Medevac 2 and his patients. Additional WP was pumped into the area by four Cobra gunships immediately prior to the rescue attempt.

At 1145 hours three UH-1 medevac helicopters sneaked into the LZ and prepared to evacuate Rocco and the other wounded Soldiers. Upon liftoff they were engaged by concentrated automatic small arms fire. Ships one and two—flown by Medevac 6, CPT Michael Hagerty, and Medevac 12, LT John Read—safely departed the hot LZ. However, ship number three, flown by Medevac 25, CWO William Sallenger, was hit. It settled to the ground and began to burn. The six Cobra gunships on station began making low level mini-gun runs and pumping 40 mm barrages into the enemy position. Under fire, the gunship's company commander, in a "B" model gunship dropped into the LZ and rescued those who had been aboard Medevac 25.

The next day nine Silver Stars were impact awarded for the individual heroics displayed through the 24-hour rescue attempts of the crew of Medevac 2. Also, on that day, the friendlies at XU-5606 were extracted and later that evening the grid square XU-5606, later to be named Medevac Meadow, was obliterated by a B-52 airstrike.

Stephen Modica

CPT Steve Modica received injuries in an attempt to rescue wounded ARVN soldiers which caused his retirement from the active Army. CPT Modica lives in River Ridge, LA and in the hearts and minds of thousands of readers who owe their lives, or their loved one's lives, to America's fighting men who are willing to sacrifice . . . that others may live

"Soldier, soldie

MAJOR GENERAL Robert M. Danford, a key figure in the birth of Army aviation, died on 12 September 1974 at the age of 95.

While serving as Chief of Field Artillery in 1941, General Danford was a dedicated advocate of making light aviation organic to the Field Artillery. Early in 1941, he was corresponding with Brigadier General Horace Whittaker, the commander of the 45th Infantry Division, who was a firm believer in the potential of the light aircraft. Then, General Danford was most impressed by Major William W. Ford's article "Wings For Santa Barbara," which appeared in the May 1941 issue of the FIELD ARTILLERY JOURNAL. [This article was reprinted in the June 1974 issue of the AVIATION DIGEST.]

In the summer of 1941 General Danford, highly satisfied with the performance of light aircraft in ongoing Army maneuvers, visited the British Artillery School at Larkhill. The British experiments further impressed General Danford and when he returned to the United States he obtained permission to evaluate the airplanes in the Louisiana Maneuvers. [See "The Army Aviation Story, Part I," June 1962 AVIATION DIGEST.]

The Louisiana Maneuvers was an unqualified success as far as proving the worth of light aircraft organic to the units they served. Backed by division and corps commanders, General Danford recommended to the War Department that light aircraft manned by Artillery officers be made organic to division and corps artillery units.

Major General Leslie J. McNair, Chief of Staff at GHQ—and other prominent general officers—were not convinced. Consequently, General McNair ordered a test of General Danford's proposal. The test led to the formation of the famous "Class Before One," which in training exercises validated the concepts that General Danford championed at the Washington level. Finally, on 6 June 1942 the War Department ordered the establishment of Army aviation.

Although initially skeptical, General McNair soon became a firm supporter of Army aviation. Reports of the value of the aircraft in combat were particularly gratifying to General Danford. Typical was the statement of a German Panzer officer: Our Panzers feared nothing—yes, we did fear those damn little planes that came over. Then we hid; even rifle fire would mean that we would get it [an artillery barrage] in three minutes.

General Danford's spirit of soldierly service was typical of both those who formed and those who have continued to develop the concepts of Army aviation. Perhaps this attitude is best reflected in Colonel Danford's own words. When he was being promoted and transferred to Washington, each battery of his 129th Field Artillery was formed and marched to his quarters. He bid them adieu, saying in conclusion, "Soldier, soldier all the time!"

Sir:

. . . It will take a long time for m many files for tidbits of informati pite my being his son-in-law for s from the Army Mutual Aid Asso as a former director. I was never erence to dates.

I can give a little more insight [see article at the left] concern He was, in fact, an extremely effi my staff when I was stationed in Sa

We rarely spoke of the war, but he proudly said, "I was an o afraid of nothing, absolutely not When those damn little planes of y and hid. We knew if they saw us artillery very quickly."

"They must have been easy tar them down?"

"Never," he said. "We couldn't Not even one rifle was allowed to fi

That's very close to the gist o knowing what a struggle he had approval for the Artillery to have civilian, incidently, knew nothing relationship to the Artillery.

General Danford was interred i wife and close to the gravesite of tery with modified military honors on September 20, 1974.

I [am sending] an excellent p Artillery when he did his fine job fo

I hope this will be of help.

CO Con Dan

lier all the time!"

or me to research General Danford's many, mation which are still unknown to me des- for some 39 years. For instance . . . a letter Association . . . mentioned General Danford ever aware of that. The letter made no ref-

ight on the former Panzer officer's remarks cerning the U.S. Artillery spotting planes. efficient and high level Austrian civilian on n Salzburg, Austria in 1952.

but once when I asked him where he served, n officer in the Panzers. We Panzers were nothing—no, there was just one exception. of yours came over, we got into the woods w us, we would be blasted to bits by your

targets," I said, "didn't you try to shoot

dn't take any chance of attracting attention. to fire at them."

st of it. I wrote my father-in-law about it, had had with the Chief of Staff in getting ave its own planes and flyers. My Austrian ing whatever about my father-in-law or his

ed in the gravesite with the remains of his e of his daughter at the West Point Ceme- nors after services in the Memorial Chapel

nt picture [right] of him as Chief of Field b for Army aviation.

Jim Wells

COL JAMES B. WELLS (USA, Ret.)
Contentment Island
Darien, CT 06820

Major General Robert M. Danford

IT ISN'T FAIR

Adapted from an article of the same name that appeared in the Canadian Forces FLIGHT COMMENT, October 1970

WHAT'S YOURS? You sure look beat!"

"Boy, I've had one heck of a day—gimme a beer—and all because of one guy!"

"What guy?"

"Old Super Snoop."

"Who?"

"Captain Dooley, the aviation safety officer. That guy can stick his nose in more people's business than any one person I know. Don't see why we put up with him. Never gives anyone a minute's peace.

"You won't believe the things he does. Won't stay in his office and work. No, he roams all over the place looking for things to gripe about. Bet he's even after you to keep the bar dry so the

elbow benders won't slip and bust their chins."

"No, not yet."

"Well, he will, just wait. A safety officer should stay in his office and not bother people. He should have you fill out a few forms every once in a while—he's got to have something to report, but he should never rock the boat. This guy is snooping around all over the place.

"You know, the aviation safety officer really has it made. He has a pipeline to the old man. Play it right with a few rose-colored reports—fill it again, please—and he can even get himself promoted.

"But this guy—you'd never believe him! You know those piles of dirt the contractors left over by the south helipads? This morning this character had a detail out smoothing them over. Said they might cause a chopper to tilt if one should accidentally land on them. A million to one chance and he's worried.

"We've hardly had any accidents around here in 2 years, and even if we did it would probably be some jerk who didn't know his job.

"And have you noticed how slow the Hobart drivers are moving these days? None of them will go faster than 15 miles per hour. That's his doing! Turns in a report on them any time they put on a little speed. Says it's unsafe. Why, some of those Hobarts will stop on a dime and give you 5 cents change. Unsafe my foot! I say let the muledrivers go as fast as they can so they can get the work done quicker."

"Another beer?"

"Yeah. Can't drink much, though, gotta fly tomorrow. Where was I? Oh yeah, Captain Dooley and his foolishness. Did you know he had the men picking up cans and other trash? And this morning two men were cutting weeds. Says cans and paper and even weeds can fly up and damage rotor blades. He just wants things looking pretty. Next thing you know he'll have pansies planted everywhere.

"He collects rocks and bolts and all sorts of debris. Got this stuff all over his office. He keeps trying to find out where it comes from, as if that makes a difference. He's got FOD-mania.

"Now he's checking tool boxes. Wants a checklist on each one. He talks to the mechanics and wastes their time by showing them flight safety movies. Asks all kinds of nutty questions about morale and what kind of personal problems they have. He really believes that if a guy's unhappy he's more likely to have accidents.

"Gimme another. Yesterday I saw some commotion over by the paint shed and I went to see what was wrong. There was Dooley raising cane. Someone had put a 5-gallon can of JP-4 in with the paint. Said that paint and JP-4 should not be stored in the same shed. Told everyone about an explosion in Vietnam [see "Fire," May 1972 DIGEST] when JP-4, paint, oil and some other cleaning materials were stored together. Now isn't that silly. That happened way over there, not here."

"Another?"

"Yeah, just one more; flying tomorrow. Don't want old snoopy checking on my drinking. Know what he's doing now? He's advertising. Yeah, advertising! Read an old DIGEST. It said he should sell safety ["Advertising, The Key to Selling Your Safety Program," May 1967 DIGEST]. Now he thinks he's a super salesman. Everywhere he's got signs, everywhere. When you come in the gate there's one and when you leave there's one. He's even got a safety display over in operations.

"I think it's all for the birds. He's been here 2 years working 24 hours a day, minding everybody's business, printing checklists by the tons, worrying everybody about accidents, looking for dust and dirt in the hangars, showing movies, giving lectures, writing memos, letters—and you know what?"

"No, what?"

"It's a complete waste of time! We haven't had an accident in these parts for years!"

"You mean like about 2 years? Have another?"

"Can't. I'm all out of ready cash."

"No problem. They're free tonight. Dooley just got promoted."

"You're putting me on! I don't believe it! That just shows the whole system is unfair. Here this young smart pants, hardly dry behind the ears, gets promoted—and for what? And here I am, twice as much seniority as he has. I always support the mess, laugh at all the CO's bum jokes and what happens to me?

"It just isn't fair."

Third Sikorsky UTTAS Flies

The third flight prototype of Sikorsky Aircraft's YUH-60A Utility Tactical Transport Aircraft System (UTTAS) has been flown. The number one aircraft was flown late last year and number two was flown early this year. The UTTAS is a high-technology, squad-carrying helicopter.

That Certain Feeling

Ever had one of those days when things didn't seem to be going "according to Hoyle"? If so, you've probably had "that certain feeling"; it should have prompted you to exercise extreme care while evaluating the circumstances that evoked that feeling

Major Joseph J. O'Neill

Army Advisor—New Jersey National Guard

WE CANNOT "fly scared" all of the time; nor can we fly with relaxed composure at all times, secure in the knowledge that the machine, the people and the environment are error free and nothing untoward can occur. But, we can develop an ability to alert ourselves to situations which give us a key that all is not well with either the machine, the people or the environment.

There are literally hundreds of situations which can arise that should alert the professional aviator. When this happens he should mentally begin to review the operation in which he is participating to make sure he is aware of all the risks involved. I have listed a few situations in an attempt to illustrate my point. For lack of a better phrase, I call this alerting of the senses "that certain feeling." An Army aviator should get "that certain feeling" when situations similar to the ones listed below arise:

- The operations NCO discovers that the aircraft you were originally scheduled to fly was taken for another mission and he says, "Well, all we have left is 176."
- The young instructor pilot giving you a local standardization ride agrees that your autorotation was done to MOI (methods of instruction) standards but says, "Let me take it around and show you how to do one with zero ground run."
- A supposedly highly experienced aviator with whom you are flying for the first time refuses to use a checklist.
- The POL (petroleum, oils and lubricants) man parks his truck as close as possible to your aircraft prior to refueling so that he will have to unroll the minimum amount of hose.
- The dash 13 on the aircraft you are preflighting states "UHF transmitter weak—range less than 3 miles on 241.0 MC." This has been signed off by an entry "ground check OK" when the aircraft is parked less than 100 yards from the tower.
- The commanding officer of a stateside slick company says that they are preparing the aircraft for airmobile training with infantry and you see the passenger seats and seat belts being removed from all aircraft.
- You are greeted by a blank look from the officer in charge of an aerial gunnery range after asking him where aircraft with loaded weapons abort to in case of an inflight emergency requiring a running landing.
- A graduate of tricycle gear fixed wing school proclaims, after 5 hours in the O-1 Birddog, that he doesn't see too much problem with landings in a "tail dragger."
- The operations officer of a slick company prepares to give a briefing for an airmobile operations without benefit of map, overlay, air movement table or operation order.
- Your copilot on an instrument flight arrives at the airfield 30 minutes prior to scheduled takeoff time without computer, pencil or charts and announces, "Man, do I need a cup of coffee."

Have you ever encountered similar situations? Let us hear about them.

Instrument Renewal Lament

A One Act Play
by

Sergeant First Class Patrick Arbenz
Operations NCOIC
Libby AAF, Ft. Huachuca, AZ

Does this sort of thing only happen to the other guy? Do you see yourself here? Ready for that checkride? Is your lapse period quickly coming to an end? Start early and stay on flying status

PLACE: Somewhere

TIME: Sometime

CAST:

Aviator: CPT Ohso Sad

Operations Officer: MAJ Tryedmy Best

FEB President: COL Stickit Toem

"Friend": 1LT Liveit Up

Instrument Examiner: LTC Flunkem All

SCENE I USASTRATCOM conference room

COL Stickit Toem: This Flight Evaluation Board (FEB) has been called to decide the outcome of CPT Sad's failure to renew his instrument certification.

MAJ Tryedmy Best: Sir, as CPT Sad's operations officer, I would like to state that this aviator was well aware of the pending expiration of his instrument certification and that the 60-day lapse period was about to expire. He elected not to become properly prepared and in so doing failed to satisfactorily complete his instrument renewal checkride in the prescribed timeframe.

COL Stickit Toem: CPT Ohso Sad, do you have anything to say in your behalf?

CPT Ohso Sad: Yes sir, I would like to – – – fade to past.

SCENE II The beach in Guaymas, Sonora, Mexico – March 1973

1LT Liveit Up: (grounded aviator) Come on Sad, you don't have to be back to duty 'til next week. Let's take a dip and hit the club.

CPT Sad: I really should get back, I've got my annual writ Monday and I should be studying.

1LT Liveit Up: No sweat, anybody can pass the writ without study–"IT'S OPEN BOOK."

CPT Sad: Well, I guess it's OK. My ticket is good until 15 May, and they always give that 60-day lapse period if you're not ready–––fade.

SCENE III Airfield Operations (somewhere in Arizona)–10 May 1973

MAJ Tryedmy Best: CPT Sad, my operations sergeant tells me that you still need to retake your annual written exam and that you lack 5 hours instrument time for your minimums. How do you expect to be ready for your instrument renewal checkride this week?

CPT Sad: Well, sir, I meant to come to you about that last month. I think that I am going to need some time to study before I can pass my annual writ and I really need about 10 hours of instrument refresher before I will feel right about taking my checkride – – – fade.

SCENE IV U-6A Beaver cockpit somewhere over Arizona–14 July 1973

CPT Sad (sweating): I couldn't have sir, it's right here in the book–where did I see that.

LTC Flunkem All: Yes, Captain, you did and for your information that isn't an airfield you are making your approach to, it is Highway 82. How did you get your ticket anyway–through correspondence courses? – – – fade to present.

COL Stickit Toem: Yes, Captain, we are waiting . . . .

CPT Sad: Yes, sir, as I was saying, there just wasn't enough time to get all the required time in the air and do the study that I needed and then weather was a big factor . . . .

THE GREAT DEBATE

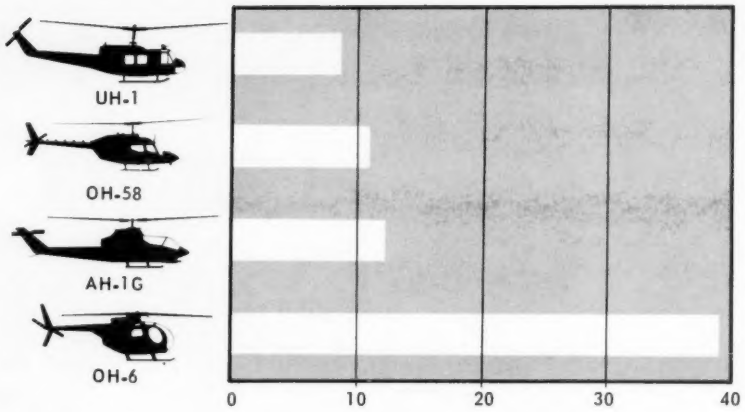
(continued from page 7)

hours of flight, as compared to 11.8 for the OH-58, 12.7 for the AH-1G and a high of 39.6 for the OH-6.

While the accident rate from emergency autorotations declined steadily during the 4-year period, that from practice touchdown autorotations remained relatively constant. It is noteworthy that although the OH-6 accounted for less than 3 percent of the hours flown during FY 1974, it was involved in 31 percent of all the practice touchdown autorotation accidents that occurred during that year. In each instance, the sequence was almost identical: a hard touchdown, followed by a bounce or fuselage rock, with the main rotor striking the tail boom.

During this 4-year period, the AH-1G autorotation accident rate climbed steadily, and as with the OH-6, the AH-1G accidents recorded in FY 1974 possessed striking similarities: hard touchdowns to sod areas followed by bounce or rotor blade flexation, with consequent damage or destruction of the aircraft.

While the number of emergency autorotation accidents involving AH-1G and OH-6 aircraft has decreased over the past 4 years, the cost in terms of autorotation training accidents remains excessive. Performance of successful touchdown autorotations in both of these aircraft demands a high degree of aviation skill and instructor pilot proficiency. The narrow skid tread and high vertical center of gravity of the AH-1G together with the difficulty experienced by the aviator in judging aircraft attitude make the touchdown phase in this aircraft extremely critical. Similarly, the shock mounted skids and the limited vertical clearance between the main rotor blades and the tail boom of the OH-6 increase the possibility of damage during touchdown. The problem with the OH-6 is further amplified by its high rate of in-flight emergencies.



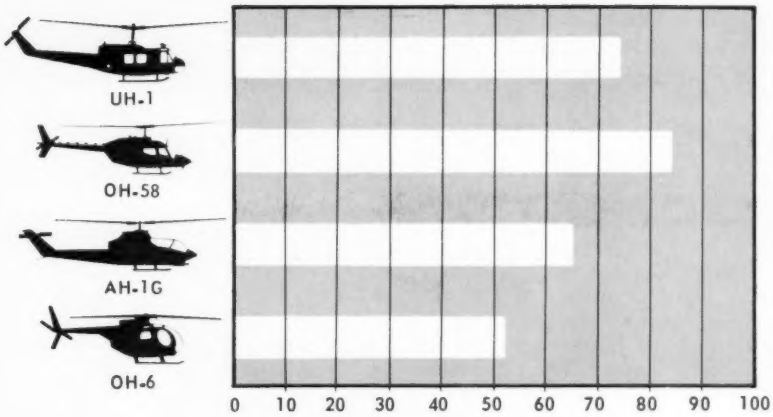
In-flight emergency rate per 100,000 flying hours by type aircraft, FY 71 through FY 74

Collectively, the four models studied amassed nearly 1¼ million hours of flight during FY 1974, and were involved in 118 in-flight emergencies necessitating autorotations. Of these, 14 resulted in accidents, establishing an exceptionally high ratio of 7.4 successful autorotations for every accident that resulted from emergency autorotations.

UH-1. During the period FY 1971 through FY 1974, the in-flight emergency rate of the UH-1 declined to the lowest level of the models studied, and 50 of the 57 emergency autorotations performed were successfully completed. The emergency autorotation fatality and injury rates decreased from .5 fatalities and 5.9 injuries per 100,000 flight hours in FY 1971 to 0 fatalities and 1.1 injuries in FY 1974. The practice touchdown autorotation accident rate remained relatively constant throughout the 4-year period, and in FY 1971, Army pilots sustained .04 fatalities and .3 injuries as a result of practice touchdown autorotation accidents every 100,000 hours of flight. In FY 1974, this rate decreased to 0 fatalities and .2 injuries.

OH-58. Of the four models studied, the OH-58 has shown the most significant improvement in reduction of the overall accident rate as well as in the number of accidents resulting from in-flight emergencies. In addition, the number of successful to unsuccessful emergency landings completed increased almost sixfold. During the 4-year period covered by the study, the training autorotation accident rate decreased and, significantly, no fatalities occurred as a result of either training or emergency autorotations.

T/AH-1G. The overall accident rate decreased sharply in FY 1974 to 15.3. The in-flight emergency rate of the T/AH-1G decreased from 30.8 emergencies per 100,000 flight hours in FY 1971 to 12.5 in FY 1973, then rose to 12.6 in FY 1974. A steady and fairly steep decrease in emergency autorotation accidents was also effected during this period. On the other hand, the training autorotation accident rate increased from 1.6 per 100,000 flight hours to 4.2 in both FY 1973 and FY 1974. The emergency autorotation fatality and injury rate declined during this period from 1.3 fatalities and 8.8 injuries per 100,000 flight hours in FY 1971 to none in FY 1974. During this same period, no fatalities and three injuries occurred as a result



Percentage of successful emergency autorotations
(includes forced landings and incidents) FY 71 through FY 74

of practice touchdown autorotations.

OH-6. The in-flight emergency rate of the OH-6 was exceptionally high throughout this period, and the number of successfully completed emergency autorotations was initially very low. In FY 1971, out of 27 emergency autorotations per 100,000 flight hours, only 11 aircraft were successfully landed. The OH-6 training autorotation accident rate initially showed a slight decline but then increased sharply in FY 1974. With the exception of FY 1973, the OH-6 training autorotation accident rate was consistently highest of the aircraft studied. Since FY 1971 when nine fatalities occurred, no loss of life has resulted from emergency autorotations performed in OH-6 aircraft. However, the injury rate has remained a fairly high level with the lowest recorded in FY 1972 at 8.4 injuries per 100,000 flight hours. As in-flight emergencies increased, this rate rose in FY 1973 to 18.0, then decreased to 15.2 in FY 1974. This represents the highest fatality/injury rate due to emergency autorotations of the four aircraft studied. No fatalities and two injuries resulted from practice touchdown autorotation accidents during the FY 1971-FY 1974 period.

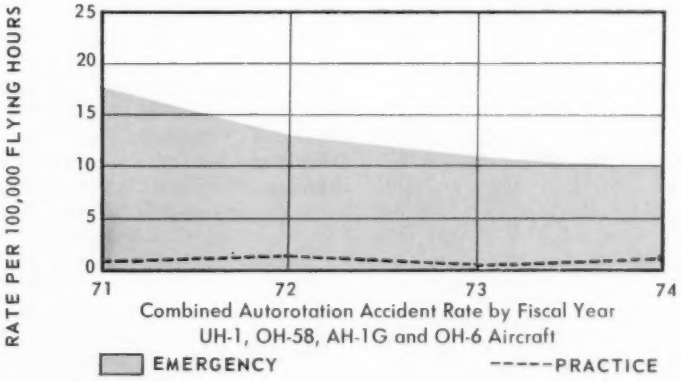
Based on individual history and performance of the aircraft studied, tentative conclusions that can be drawn include the following:

Although the current in-flight emergency rate for UH-1s is the lowest of the four models studied, giving a statistical probability of one emergency autorotation every 14,200 hours of flight, the aircraft's primary mission justifies the continuance of autorotation training. Further, the current training procedures appear effective as indicated by the steady increase in successful emergency landings and the relatively low training autorotation accident rate.

While the OH-58 autorotating characteristics are considered good due to its ground stability and high rotor inertia, it is felt that the in-flight emergency rate of this aircraft (11.8/100,000 hours) and its normal operating mission justify the continuance of autorotation training based on the assumption training reduces emergency autorotation accidents. Current autorotative techniques and training procedures appear highly effective.

T/AH-1G touchdown autorotation training appears effective in reducing accidents as a result of emergency autorotations. However, the cost in terms of training autorotation accidents has been substantial. Considering the T/AH-1G in-flight emergency rate and the high degree of skill required to land this aircraft successfully in autorotation, continued training in emergency procedures is justified. That no T/AH-1G autorotation training accidents have occurred during any formal course of instruction over the past three fiscal years suggests that increased emphasis on IP proficiency standardization and close command supervision could improve field experience rates.

Although the OH-6 reliability and successful autorotation ratio are certainly not impressive, the sharp increase of in-flight emergencies is particularly disturbing. Further, the cost in autorotation training accidents is excessively high when we consider that five accidents occurred in 33,000 flying hours for a rate of 15.2 acci-



Combined Autorotation Accident Rate by Fiscal Year
UH-1, OH-58, AH-1G and OH-6 Aircraft

dents per 100,000 hours of flight.

What about our sister services? In the Air Force, practice autorotation policies are a combination of Air Force and major command directives. Practice touchdown autorotations from a hover are permitted in single-engine H-1 (similar to the UH-1) helicopters, but to power recovery in all other H-1s. Further, practice autorotations in twin-engine helicopters are to power recovery, although selected IPs are permitted to perform touchdown autorotations in H-43 helicopters. However, this is for initial qualification only. Within all commands, practice autorotations must be performed to a suitable surface with adequate runout area.

The Navy performs its initial training at Pensacola, Florida, where the H-57 (similar to the OH-58) and the H-1 are used. Each student receives approximately 12 touchdown autorotations during this training phase, and chances are that this will be the only time he will perform practice autorotations to the ground. Twin-engine helicopters are restricted from this maneuver by directive. The authority to conduct touchdown autorotations is decentralized and delegated to the squadron commander. It is estimated that few, if any, Navy commanders will authorize the performance of practice touchdown autorotations. Proficiency is maintained by power recovery autorotations.

Comparing our accident experience involving forced landings due to in-flight emergencies with that of the Air Force and Navy, we find that during FY 1974, Army pilots had a higher success rate (forced landing to accident ratio) than either the Air Force or the Navy. However, this success rate does not include Army aircraft involved in accidents while practicing autorotations. Does this indicate that we might possibly have fared better had we not practiced touchdown autorotations? Not at all. Because of the greater number of Army helicopters in operation as compared with those of the Air Force and Navy, during FY 1973, Army pilots had approximately 12.8 times as many in-flight emergencies in single-engine aircraft that necessitated autorotations than did the Air Force in their single-engine aircraft, and 6.4 times as many as the Navy in theirs. In FY 1974 these figures were approximately 8.5 and 6.1 respectively. The few in-flight emergencies experienced by both Air Force and Navy helicopter pilots make those services' success-to-failure ratios susceptible to wide variations.

Another important fact we must consider when making comparisons is that approximately 57 percent of all Air Force helicopters and 86 percent of all Navy helicopters are multi-engine while only 6 percent of Army helicopters have more than one engine. Similarly, the terrain over which the emergency occurs plays an important role as to whether or not an accident will result. So does the aircraft itself. For example, does the design of one aircraft make it less stable than another? Does it place greater demands on pilot skill? These are just a few of the variables that must be considered.

As for the mishaps that occur during training under controlled conditions with ample supervision, we can examine the record established at the Army Aviation Center. During FY 1974, a total of 307,574 practice touchdown autorotations were recorded. During their performance, 7 accidents and 22 incidents occurred, establishing a rate of 2 accidents and 7 incidents every 100,000 practice autorotations. It is significant that these autorotations included those performed in CH-47, CH-54 and TH-55 aircraft as well as those performed in the four models studied. Further, the TH-55 which is used in primary flight training accounted for 6 of the 7 accidents and 16 of the 22 incidents. However, despite the nearly one-third of a million practice autorotations performed, these data are not sufficiently inclusive to permit the formulation of solid generalities because of the select population involved and the limited time frame.

After careful study and analysis of these and other data generated by the autorotation study, it is the opinion of both USAAAVS and USAAVNC that the overall autorotation training accident rate is not considered excessive. Therefore, a change in DA policy to eliminate touchdown autorotation training is not recommended at this time. However, some changes are indicated. Specifically, appropriate publications should be revised to clearly state that autorotations are *not* to be regarded as simply another graded maneuver during periodic standardization flight evaluations; but that they, and all emergency procedures, are to be demonstrated and performed to achieve necessary proficiency. Clarification is also needed on the objective of "minimum ground-run" autorotations, i.e., the intent is solely to reduce risk of accidents, and should not be construed as requiring precision touchdown or zero ground-run autorotations.

While the OH-6 accounted for less than 3 percent of the hours flown during FY 74, it was involved in 31 percent of all the practice touchdown autorotation accidents that year. In each instance, the sequence was identical: a hard touchdown, followed by a bounce or fuselage rock, with the main blade striking the tail boom

How do Army pilots feel about this matter? Based on a USAAAVS survey of more than 7,600 Army aviators, the predominant feeling is that practice touchdown autorotations should definitely be continued. Analysis of information provided by these aviators indicates the reasons influencing this feeling include a firm belief that this training builds confidence that enhances the aviator's chances of successfully coping with an emergency should it arise.

Nevertheless, it is important to realize that despite the best efforts of statisticians, psychologists and other researchers, we have not been able to pinpoint to what extent autorotation training prevents mishaps during actual emergencies. We do know, however, that the number of successfully completed autorotations from actual in-flight emergencies has progressively increased. Considering that approximately 94 percent of our helicopters are single-engine and, with the exception of the UH-1, the high in-flight emergency rate of the helicopters predominantly in use, the concensus of opinion, understandably, is that practice touchdown autorotations should be a regular part of training but with additional controls.

While this decision is felt by both the USAAVNC and USAAAVS to be the best decision, the matter is not to be shelved. As additional experience is gained, recorded and studied, and as changes are made in equipment, we may find that sometime in the future we may want to modify our present position or even change it entirely. Much depends on aircraft reliability, aircraft design, extent of difficulty in performing autorotation landings in aircraft predominantly used, terrain over which the aircraft is flown, and other factors. For the present, the debate has ended. The question as to the merits of autorotation training has been answered and the policy to be followed established.

This policy, as initiated by USAAVNC and USAAAVS and directed by HQDA, applies to all Army aviation units worldwide. It neither limits nor restricts the scope of training. Instead, it embodies sound principles that give commanders freedom to conduct all phases of training necessary to develop pilot proficiency while reducing the risk of accidents and injuries. In addition, as recommended by USAAAVS, every handbook used by pilots in which the word "autorotation" appears in the "maneuvers" section will be revised, deleting "autorotation" from that section and transferring it to the "emergencies" section.

All controls as stated in HQDA message R031310Z January 1975 are reprinted as follows:

> . . . 2. The following constitutes HQDA policy guidance on practice touchdown autorotations based on the accepted conclusion that, as a minimum, the current policies and procedures have been effective in Army aviation accident prevention efforts. The policy and procedures criteria concerning practice touchdown autorotations considered minimum are stated herein for single-engine helicopter day operations:
>
> a. Practice touchdown autorotations shall be conducted only under the following conditions:
>
> (1) During formal courses of instruction at USAAVNC.
>
> (2) During rotary wing transition flight training courses which have been approved by appropriate authority.
>
> (3) During standardization instructor pilot, instructor pilot, and aviator periodic standardization evaluation flights.
>
> (4) When deemed necessary by the appropriate commander.
>
> b. When practice touchdown autorotations are conducted, the following criteria shall apply:
>
> (1) Be controlled by the local standardization board as an organized and closely supervised program.
>
> (2) Be conducted only in designated training locations that have air-to-ground communications, crash/fire rescue facilities available, and are free from obstructions. A method for opening and closing the training area shall be established.
>
> (3) Be conducted only in dual-control equipped aircraft with a qualified instructor pilot at one set of controls who is current and proficient in practice touchdown autorotations in the mission, design and series helicopter being flown.

(4) Only the minimum flight crew required shall be aboard the aircraft during practice touchdown autorotations.

(5) No more than six practice touchdown autorotations per instructor pilot and/or student shall be performed during any 1-hour instructional period. Consecutive 1-hour autorotation instruction periods should not be scheduled in any one day.

(6) Practice touchdown autorotations involving turns will be initiated at sufficient altitude to enable the aircraft to be established straight in to the touchdown area at no less than 200 feet agl.

(7) Practice low level touchdown autorotations may be performed at designated training locations subject to the following conditions:

(a) Approach zones must be sufficiently clear of obstructions to permit visual contact with the point of intended landing from autorotation entry to termination.

(b) Entry speeds and altitudes will be as specified in flight training publications for aircraft flown.

(c) Autorotations will be straight in, maintaining a constant ground track. Speed reduction climbs or "pop-up" type entries will not be performed.

(8) Unanticipated surprise practice touchdown autorotations will not be performed.

(9) Minimum ground-run autorotations should not be construed as requiring precision touchdown or zero ground-run autorotations. The intent of practice of minimum ground-run autorotations is solely to reduce the risk of accidents.

c. Forced landings and power recovery/terminate with power practice autorotations are encouraged and may be conducted where:

(1) Forced landing recovery is initiated so that descent is terminated at a minimum of 200 feet above the highest obstruction.

(2) Power recovery/terminate with power practice autorotations are conducted to an approved training area only.

d. Practice hovering autorotations (aircraft in stationary hover) are excluded from the above minimum criteria; however, unanticipated surprise practice will be eliminated except for instructor pilot training.

3. The policy and procedures criteria concerning practice touchdown autorotations considered minimum are stated herein for multi-engine helicopter day operations:

a. Practice touchdown autorotations with all engines out of flight position are prohibited.

b. Practice of single-engine flight to touchdown shall conform to the criteria of paragraph 2, where applicable.

4. The criteria as outlined in paragraphs 2 and 3 above for day practice touchdown autorotation training for both single- and multiengine helicopters will be complied with for night operations. In addition, specific training locations should be designated and equipped for the conduct of practice touchdown autorotations at night.

5. Renewed command emphasis will be directed toward continuing and further education, training and supervision of practice touchdown autorotations. . . .

SOME YEARS AGO, an employee of a major corporation accidentally fell into a work pit, breaking his leg. Because of the elaborate safety precautions and strict regulations in effect at the plant, the safety engineer was at a loss to explain the accident and decided to reconstruct the site and reenact the events that led to it. When all preparations were complete, the injured employee (his leg in a cast) was brought to the area and the reenactment began. The rest you can guess. The man promptly fell into the pit, breaking his other leg.

About the time these events were taking place, another set closely paralleling them was occurring elsewhere at a different kind of installation. With the crew and nearly a full load of passengers on board, an Army helicopter was making a takeoff during a hot summer day. As the craft gained altitude, it began to flounder, weaving and bobbing like a cork floating over ripples on a pond until it finally crashed. Fortunately, none of the occupants were injured although the aircraft sustained

Ted Kontos
Publications and Graphics Division
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USAAAVS

BEWARE! Temperature on the Rise

major damage. The crew and passengers were then transferred to another aircraft of the same type and—get this—one additional passenger added before takeoff was attempted. The results can best be described as watching instant replay on TV. The culprit? High density altitude.

The point is simple and valid: If professionals in their respective fields can be involved in two accidents in a row from identical causes, the chances of individuals with varying degrees of experience being involved in a single accident from a particular cause becomes not only possible but probable. How probable? During a single summer, the Army reported 74 mishaps, including 28 major accidents, as having resulted from actual or practice autorotations. The common denominator in all these mishaps was, once again, high density altitude. Well, summer is here, and like it or not, so is high density altitude as well as a host of other phenomena associated with hot weather operations. Only through knowledge and proper application of it can we successfully combat the problems associated with hot weather flying.

To begin with, the relationship of pressure, temperature and humidity of air establishes density altitude. For practical purposes, we can express density altitude as the relative altitude or load-lifting ability of air as it expands and contracts. At times, their expansion and contraction seem unbelievable. At one Army post, for example, the actual elevation ranges from 300 to 500 feet above sea level. Depending on weather and time of day, the density altitude may vary from minus 1,000 feet to plus 4,000 feet. Consider that a UH-1H at a gross weight of 9,500 pounds can clear a 50-foot obstacle with a zero ground run (vertical takeoff) under standard (15 degrees C.) sea level conditions. With a temperature rise to 35 degrees C. the aircraft will require a takeoff distance of 225 feet and an airspeed of 20 knots to clear the same obstacle. In desert country, shifts in density altitude are frequent, rapid and, often, greater.

Low density air (high density altitude) also affects engine performance. High humidity alone can cause a reciprocating engine to lose as much as 12 percent of its rated brake horsepower, and while the volume of air flowing through a gas turbine engine may remain constant, at high density altitudes this thinner air contains less mass, and thrust (power) is lost. A tem-

perature of 100 degrees F., for example, reduces gas turbine engine efficiency by approximately 15 percent from that under standard conditions of 59 degrees F.

Seasons for thunderstorms. As if the combination of heat, humidity and altitude do not create enough problems for the pilot, summer is also the season for thunderstorms. Every day an estimated 44,000 of them occur over the earth's surface. About 1,800 of these churn the atmosphere every minute, discharging nearly 100 flashes of lightning each second.

There are no procedures that can guarantee safe flight through thunderstorms! Steps outlined in the various dash 10s are for use in an emergency. Knowing and following these procedures are your best course of action should you inadvertently become trapped in a thunderstorm, but they cannot assure your safety.

With all the facilities available to the pilot—weather forecasts, advisories, special advisories, pilot's reports, radar coverage, plus alert flying on the part of the pilot—there is little reason for accidentally flying into a thunderstorm. Clouds are excellent signposts of convective air currents that build cumulus clouds. As the day progresses, billowy white puffs may increase in number and size, and change in form, often becoming cumulonimbus or thunderstorm clouds with varying degrees of turbulence, rain, lightning and, sometimes, hail. A towering cumulus can change into a raging thunderstorm in as little as 10 to 15 minutes. Excessive radio static may also indicate the approach of a thunderstorm.

Airmass thunderstorm cells build up over land during the heat of the day and usually break in the late afternoon or early evening. However, either airmass or frontal type thunderstorms may be encountered at any time. If storms are scattered, they generally can be circumnavigated. But trying to climb over them, slipping under them or penetrating a solid squall line are definite no-nos.

Cold weather problems have temporarily vanished, but a new set of hot weather hazards is about to take their place . . .

The heaviest turbulence in a thunderstorm is found in the area of heaviest rain, and downdrafts often extend below the base to as low as 300 feet above the ground in the rain cone. Attempting to take off or land when a thunderstorm is approaching an airfield is an extremely hazardous practice. Gusty surface winds and downdrafts that precede a thunderstorm can be exceptionally violent and have caused fatal accidents. Obviously, the larger the storm cell, the greater the likelihood of destructive hail which can be tossed out of a cloud into the clear sky adjacent to it.

While the turbulence caused by thunderstorms is the most violent variety, that associated with heat and terrain should not be overlooked. Heated thinning air rises in the form of thermals, pulling cooler air along the ground. This air boils and bubbles as it flows over hills, and hits peaks and ridges. Under normal conditions, turbulence is little more than an added irritation, making the already difficult task of flying an exacting mission a little harder. But when turbulence is teamed with its hot weather companion, high density altitude, the pilot's position becomes precarious. He may suddenly find himself on the ground after encountering an unexpected gust he would ordinarily have been able to handle with ease.

Anticipating this kind of turbulence, even though it can't be seen, is one way of coping with

it. Areas bare of vegetation, hilly or broken terrain and an abrupt change from one kind of terrain to another all lend themselves to turbulence. Undershirts flapping on clotheslines, smoke trails, waving branches and blowing dust serve to tell a pilot the air below him is acting up. Forewarned, he is less likely to run into trouble.

Heat stress on personnel. Although the in-flight hazards associated with summertime flying are of primary concern to the pilot, the adverse effects of heat and humidity on personnel must not be ignored. Yet, because of the limited physical activity of the aviator and the decrease in temperature with altitude, heat stress in military aviation is often underestimated. But airfields can become extremely hot places, and heat stress during ground operations is likely to be extreme for aviators as well as for ground personnel. Even at altitude in cooler temperatures the heat gained by radiation through the canopy is significant.

The effects of excessive heat and humidity on an individual can range from simple discomfort and reduced physical and mental efficiency to heat cramps, heat exhaustion and heatstroke. Since water and salt losses cause dehydration and reduced efficiency long before any sign of heat illness, ensuring an adequate intake of water and salt is essential. Even though our bodies can recover after water deficiencies of 10 to 15 percent of body weight, losses of even 1 to 5 percent produce discomfort and a decrease in efficiency. The amount of water required depends on the amount of sweating which occurs and varies from one individual to another. Since thirst is not a dependable indicator, water should be taken frequently. And while the amount of salt taken with food may be adequate under average conditions, additional salt is usually required during hot weather operations. Because salt tablets taken whole tend to cause nausea in some individuals, it is better to dissolve the tablets in water. Two salt tablets in a canteen of water make a satisfactory solution.

Field exercises. Unfortunately, too many of us have had to relearn—the hard way—that it takes a bit of time to get back into the peak of condition after a prolonged period of idleness. Aside from aches and pains that accompany any conditioning program, we rediscover that the heat of summer can hasten fatigue and cause rapid exhaustion, and sometimes, consequences of a more serious nature.

The process of conditioning our muscles, building up endurance and getting accustomed to the inevitable heat requires time. Fortunately, most of us can afford the necessary time. But if you happen to be an aviator in a unit about to embark on field exercises, and if you have been neglecting your daily calisthenics, time is at a premium. And physical conditioning may be only one hurdle you must clear. What about flight proficiency? Have you been lax in that area also? Sure, you've been down this road before. These exercises are nothing new. You're highly experienced and well qualified and you have performed admirably in the past. Granted you possess the knowledge, experience and skills necessary to do your job; and nobody can take these away from you. But also keep in mind that even the finest honed blade loses some of its edge with disuse. Without a doubt, conditioning to ensure both personal physical fitness and flying proficiency is imperative for peak performance and safety in the field. Failure of aviators to be amply prepared has resulted in numerous accidents and other types of mishaps.

Oddly enough, it is often easier and faster for you to get back into top physical shape than to regain peak flying proficiency. Jogging, playing tennis, swimming, riding bicycles, canoeing, hiking and participating in other summer sports, along with some modification of diet (including moderation in the use of alcoholic beverages), can put you back into the pink of condition in a relatively short time. But polishing up your flying proficiency may be more difficult. Aircraft may not be available for your use. The nature of your present assignment may place a premium on the amount of time you can spare for flying. And intervals between flights may, of necessity, be lengthy.

A good place to start is with a check of the latest aviation safety publications to make sure your information is current. This includes a review of your dash 10. Depending on the amount of time you can spare, all sorts of texts, publications and even correspondence courses are available. If you have access to link trainers or flight simulators, excellent! But nothing can take the place of actual flight to sharpen your reflexes and procedures.

On the other hand, maybe you are one of those individuals who stay in top physical condition and maintain flying proficiency year-round. Good! But even if this is true, there are other factors you must consider. In the field you will be working as part of a team—not merely as an individual operating a single aircraft. You may find yourself in severe turbulence induced by large numbers of aircraft operating out of the same confined area. You may be close to other aircraft during flight, and you may have to perform preflight inspections, and cockpit checks in a hurry. These are but a few of the conditions you may encounter. In the past, they have directly

or indirectly contributed to such mishaps as rotor blade strikes, midair collisions, tree strikes and in-flight component failures. Add inclement weather, terrain features which are conducive to strong gusty crosswinds and downdrafts, blowing dust and sand, then couple these to combat-like pressures to perform missions, and mishaps can readily result if careful preparation has not been made.

Before any field exercise begins, every commander sits down with his key staff and maps out plans for his unit. These plans try to cover every conceivable event that might arise. They include safe flight operations, problems involving personal hygiene, maintenance and logistic support, and even a backup plan that allows for emergencies or special problems not predicted. But while the commander is responsible, he cannot do the job himself. He relies heavily on others. In this respect, the aviator plays a key role.

He must do his share of planning and preparation. Even if he is current and proficient, he must realize that there are different levels of proficiency, usually determined by experience. He alone knows his level, his capabilities and his limitations. Further, he is the only one who knows if he has any personal problems which, when added to fatigue, tension and pressure that abound in the field, can be the deciding factor between a safely terminated mission and an accident.

The commander can ensure that the field site is thoroughly reconnoitered and properly prepared—that plans are well laid. He can demand that by-the-book procedures be followed, and that discipline be stringently enforced. But while planning must come from the top, thorough and efficient management dictates that each individual do his share of preparation before men and machines head for the field. Following are some points to consider:

Locale. Geographic location is a prime consideration. What temperatures can be expected? What kind of weather? What is the surface elevation? Does it vary drastically? In some areas, surface altitude may vary from 1,500 to 9,000 feet.

Elevation, type of terrain and prevailing temperatures combine to cause problems for the aviator in the field. For example, when we think of the desert, we usually think of heat, particularly that which occurs during the day and which may rise to a temperature of 110 degrees F. or more. But this is outside air temperature (OAT). When the sun is shining and the OAT is 96 degrees F., the metal of a parked aircraft painted olive drab registers 136 degrees F. The pilot's shoulder harness buckle in a parked aircraft reached a measured 150 degrees F. Even in-flight cockpit temperatures often average 3 to 6 degrees above OAT. At night, the temperature may drop to 42 degrees F.

Winds can be highly treacherous in desert country. They can spring up from seemingly nowhere and blow in six different directions around mountains and dunes. Drastic weather changes can occur with equal rapidity.

Dust and Sand. In certain areas of operation, problems associated with heat are magnified by dust and sand. Operating procedures in these areas differ from normal procedures in that additional precautions must be taken.

While dust and sand are to be expected in desert areas, they can adversely affect flight safety by drastically reducing visibility under whirling rotor blades and behind propellers. Helicopter pilots who attempt hovering takeoffs, and fixed wing pilots who reverse their propellers during landings may find themselves suddenly and completely on the gauges.

Depth perception also becomes a problem. Pilots who have made landing approaches over smooth water know how tricky it is to accurately judge heights. Smooth, dry lake beds and many other flat areas with no significant vertical references pose the same problem. This is especially true at night. To add to this confusion, the desert often throws a mirage in your path.

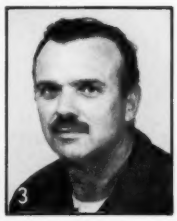
Blowing dust and sand can also effectively hide terrain features and landmarks as well as wires and other obstructions. Thorough air and ground reconnaissance is your best insurance.

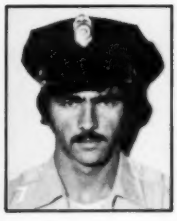
Along with planning and preparations, the establishment of rigorous standards represents the most effective way that accident-producing agents can be successfully overcome. Supervision of all phases of operations and performance of all personnel engaged in the exercises is an absolute must.

Field exercises serve an important purpose: They teach personnel how to better handle themselves should the real thing come along and they test each man's ability to perform his tasks with proficiency and safety. At the same time, they point out weaknesses for improvement. A little forethought now will enable aviation units to maintain enviable safety records while successfully accomplishing their missions.

After all, if you were to approach a house surrounded by a fence and found a sign posted on it that read: BEWARE—VICIOUS DOG, chances are you would either make certain the dog was chained before you opened the gate or call the owner outdoors. Well, the seasonal sign "Temperature Rising," is posted; so for safety's sake (and yours) BEWARE!

Well Done





These men were recommended for appropriate awards in recognition of a job well done. (1) CW2 Robert Martin and (2) SP5 Johnny Baker, Soldiers Medal and Navy/Marine Medal; (3) SP6 Wayne Bishop, Soldiers Medal; (4) Mr. Hubert Nuckolls, (5) Mr. John P. McCrimmon, (6) Mr. Walter P. Walker and (7) Mr. Pleasant Parker, Meritorious Civilian Service Award.

DURING THE LATE evening of 7 February 1975, a Marine Corps CH-53 helicopter refueled at Cairns Army Airfield, Ft. Rucker, AL. During takeoff, the aircraft crashed and burst into flames.

The few minutes following the crash produced several acts of heroism which prevented a major accident from becoming a tragedy. Some of these acts were performed in the line of duty, some above and beyond the call of duty and some out of pure instinct to help during an emergency. But all were done at the risk of personal injury and all are worthy of recognition for a job well done.

The time of the crash was about 2238 hours. CW2 Robert Martin, an Army Reserve aviator from the 121st ARCOM in Birmingham, AL, was preflighting an OH-58 and was the closest one to the crash site (about 200 feet). Mr. Martin started running to the aircraft immediately after it crashed.

Mr. Hubert Nuckolls, a Department of the Army civilian, and SP6 Wayne Bishop were in a nearby hangar. Mr. Nuckolls had been watching the CH-53 take off and saw the crash. Both men headed for the crash site in a jeep.

The air ambulance crew on duty that night consisted of CPT Robert Mitchell, pilot in command; 1LT Gregory Eggert, copilot; SP5 Johnny Baker, medic; and SP4 Henry Sullivan, crash-rescue specialist. CPT Paul Winckel and CW2 Richard Burlingame were off duty but were there watching a pinochle game. These men became aware of the accident when the building they were in was shaken by the impact.

SP5 Baker and SP4 Sullivan left immediately for the crash site. Baker stopped by the Flatiron aircraft to get his aid bag and respirator.

Eleven of the twelve firefighters on duty were already in bed. The twelfth man was on alarm watch and heard the crash. He immediately hit the alarm and light switches about 2 to 3 seconds ahead of tower personnel. Wheels of the firefighting vehicles were rolling within 30 seconds after the alarm.

Upon impact, the aircraft started breaking up and large pieces of the rotor system were flying all around CW2 Martin as he approached the wreckage. Mr. Martin used his flashlight to signal the tower as he ran toward the wreckage.

When he arrived, he found one of the injured crewmen under the aircraft. He pulled the crewman about 35 to 40 feet and then released him and started running back to the aircraft. Then the fire started and Mr. Martin anticipated an explosion so he hesitated until the fire silhouetted another crewman. The second crewman was also injured and was lying face down in about the same place the first man had been. He attempted to pull the man to safety but was unable to move him very far.

Mr. Martin saw Mr. Nuckolls and SP6 Bishop approaching and yelled for help. Mr. Nuckolls helped Mr. Martin get the second man clear of the wreckage. As the second man was being carried to safety, Mr. Martin looked back and saw a third crewman coming through an escape exit. He could see SP6 Bishop going to assist

WELL DONE

the third crewman so he stayed with the first two and started checking them for obvious injuries such as bleeding.

All three crewmen were questioned about how many people were aboard and it was learned that a fourth man was still in the burning aircraft.

SP5 Baker arrived and started administering first aid to the injured. About the same time, Mr. John P. McCrimmon, a 26-year veteran fireman, arrived in a crash rescue vehicle. SP6 Bishop told Mr. McCrimmon about the man still in the aircraft. The cockpit portion of the aircraft remained in an upright position but was leaning. It was the only portion that wasn't completely engulfed in flames. Mr. McCrimmon approached the aircraft from the right side and found the pilot still conscious but seriously injured and unable to get out.

During the same time frame (a matter of seconds), two large firetrucks were approaching the wreckage. The turrets were already in operation and the fire extinguishing agent was spewing on the fire while the trucks were still rolling. Mr. Walter P. Walker, a 9-year veteran fireman, ran to the aircraft and helped Mr. McCrimmon get the injured pilot out of the burning wreckage. The pilot's clothing was steaming from the intense heat of the burning wreckage and he was apparently in severe pain.

SP5 Baker, with nothing more than his flight suit for protection, braved intense heat and fumes by moving within 25 feet of the burning aircraft to determine the fourth man's injuries. He directed that the injured man's back be supported while he was being moved. A third fireman, Mr. Pleasant Parker, assisted in supporting the pilot's back while he was being carried to safety.

While Baker was with this fourth man, pools of burning JP-4 were formed only 15 feet away from them, but Baker continued to give first aid.

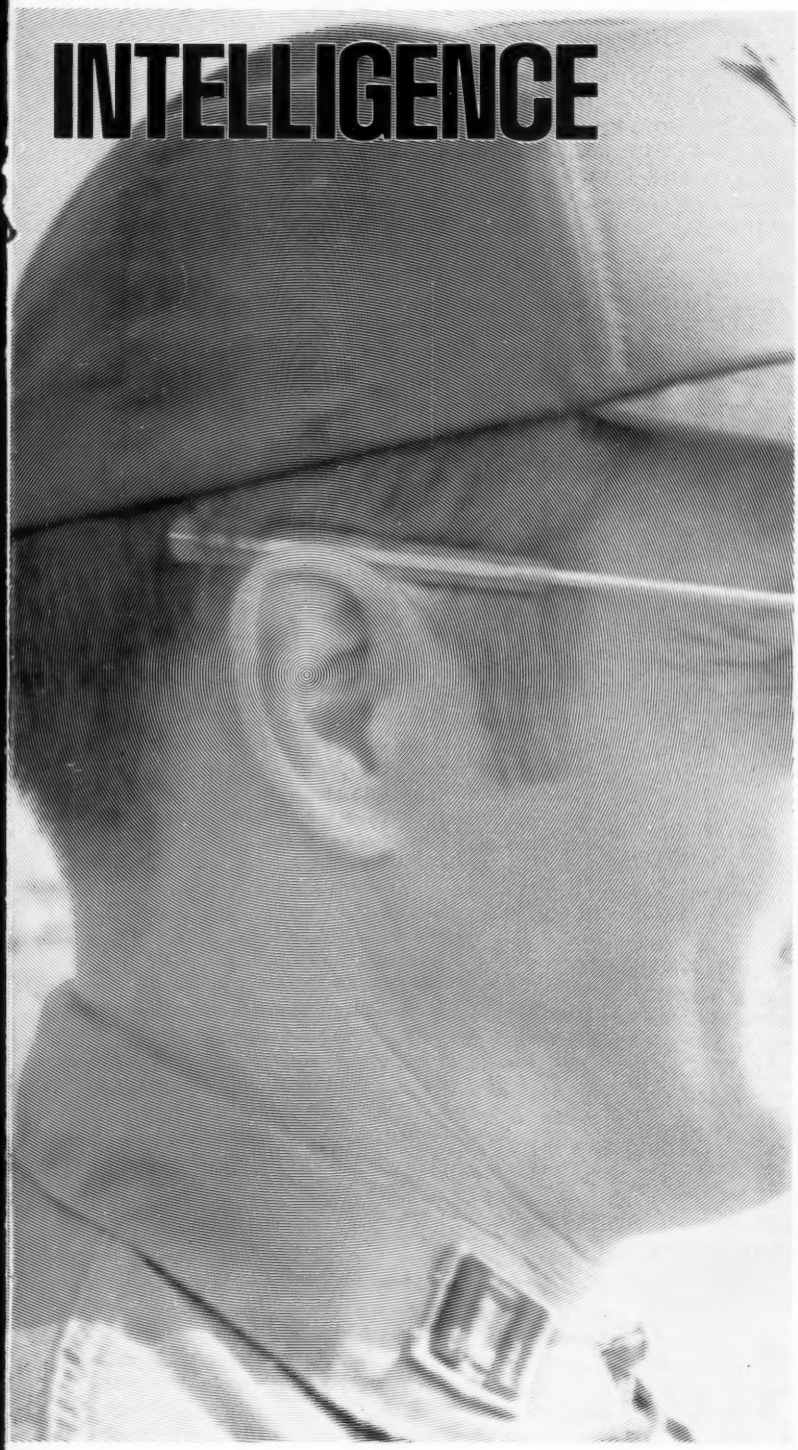
About 2 minutes after impact, CPT Mitchell had the Flatiron aircraft cranked and told the tower he was standing by. CPT Mitchell kept his aircraft back from the crash site so he wouldn't hamper the rescue efforts. SP4 Sullivan ran to the Flatiron aircraft for more medical supplies and told CPT Mitchell they had at least three patients and maybe more. Then CPT Mitchell told the tower he was moving in.

CPT Winckel had already alerted hospital personnel to prepare for receiving crash victims. He also requested ground ambulances because he did not know how many people were aboard the aircraft. CPT Winckel and CW2 Burlingame later took a Flatiron aircraft and hovered over the crash site with a search light looking for additional victims.

CPT Mitchell moved the Flatiron aircraft within 40 to 50 yards from the crash site to load the patients. Flames were estimated to be 80 feet high. Mr. Martin ran to the Flatiron aircraft to get a rigid litter for the patient with the back injury. Several men assisted in loading the two seriously injured patients aboard the Flatiron aircraft. CPT Mitchell estimated that they arrived at Lyster Army Hospital with the two patients about 10 minutes after their aircraft crashed. The other two patients were taken to the hospital by ground ambulance.

Although five or six of the firemen on duty that night were relatively inexperienced, observers praised their teamwork and professionalism. Each man knew his job and they functioned as a precision team. Fort Rucker Fire Chief John R. Harrison attributed this to their intensive training.

INTELLIGENCE



USAAAVS

Patsy R. Thompson

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U. S. Army Agency for Aviation Safety
in cooperation with
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U. S. Army Aeromedical Research Laboratory

MILLIONS OF PEOPLE today are afflicted with serious hearing loss caused by diseases, infections, injuries, aging and excessive noise. Among these causes of hearing loss, excessive noise has become a major menace to hearing. Much of the hearing loss from this source can be prevented by proper hearing conservation measures.

The normal healthy ear is a remarkably sensitive receiver by which we obtain much of our information about what's going on around us. A normal ear permits the hearing of frequencies (pitches) from 20 to 20,000 Hertz or cycles per second over a wide range of intensities. Exposure to excessive noise reduces this capability by producing either a temporary or permanent insensitivity to some or all of this frequency range. With temporary or permanent hearing loss, one may experience a sensation of fullness in the ear or a high-pitched ringing. With temporary loss, these symptoms usually disappear and normal hearing may return after a period of hours. However, a permanent hearing loss means that sensitive nerve cells have been destroyed and hearing damage is irreparable.

Typically, this noise-induced hearing loss manifests itself first as a high-frequency loss which proceeds gradually to include a wider frequency range. The initial loss frequently goes unnoticed by the individual since it does not include many of the frequencies required for understanding speech. By the time a person experiences

difficulty understanding conversation, his hearing has been seriously impaired. The insidious nature of this process requires every individual to be aware of the potential hazard of excessive noise exposure.

Not only does excessive noise affect hearing, it also creates safety hazards, annoyance and inefficiency because:

- In an extra noisy environment, one may not be able to hear a warning signal or critical communication.
- Noise may cause stress and fatigue or distract one's attention from demanding or difficult tasks.
- Severe noise can produce nausea and sometimes annoying ringing in the ears which continues after the noise has ceased.

It has been reported that hearing loss is the number one health hazard in the Army. A recent survey of the prevalence of hearing among U. S. Army personnel revealed that, after 10 years of service, one out of two career service personnel had sustained serious hearing loss which adversely affected his military career. Aside from the impact of hearing loss on the lives of the individuals, the excessively high cost associated with hearing loss is needless when compared with the available easy-to-use and inexpensive protective devices. For instance, in 1974 alone, the Veterans Administration paid out approximately $64 million to veterans with hearing loss.

What is the nature of these sounds which produce adverse effects on our ability to hear? For purposes of assessing hazards to hearing, scientists usually consider two types of noise. The first is steady-state noise which can be either continuous or intermittent. This noise is characterized by a relatively steady level for a long period of time. In Army aviation, high-intensity steady-state noise is particularly common near or inside aircraft being operated on the ground and in flight, near aircraft engines being operated on stands, and in engine repair and testing shops. The second category of noise is impulsive noise characterized by a high peak intensity and duration of only a fraction of a second. Examples of impulsive noise include weapons fire,

"You Know I Can't Hear You

Second Lieutenant John Sykes III
Academy of Health Sciences
Fort Sam Houston, Texas

ACT I— SCENE I

Dramatis Personae: Messrs Wilbur and Orville Wright, reporters, photographer and various onlookers.

The Scene: Kitty Hawk, North Carolina, December 17, 1903. (It is seconds after man's first successful powered flight. Orville is just getting up from the pilot's "seat" and is removing his goggles. Wilbur enters stage right, running up to his brother to congratulate him. Will shakes his hand, slaps Orville on the back and says:)

WILBUR: We've done it! We've done it! We've proven that man can fly in a heavier-than-air craft! How was it, Orv? What did it feel like?

ORVILLE (shaking his head and putting his index finger into his left ear): Wa-Wa-What? What did you say, Will? I can't hear anything but this d---- buzzing and ringing in my ears!

CURTAIN

ACT I— SCENE II

Dramatis Personae: Mr. Igor Sikorsky, an assistant, photographers, reporters and a few onlookers.

The Scene: Long Island, NY, 1940. (Mr. Sikorsky has just completed man's first successful vertical takeoff and landing flight. Onlookers and reporters are rushing up to speak to this now-famous man. The assistant is helping Iggy out of the cockpit of his "helix-opter" as the first reporter on the scene speaks.)

REPORTER (with a microphone in his hand): Congratulations, Mr. Sikorsky! You have proven beyond the shadow of a doubt that man, the frail but intelligent creature he is, can not only leave the surface of this terra firma successfully and with the utmost grace but, once he has become airborne in such a manner, can also return to the safety and security of our home planet without so much as a contusion or abrasion to the fragile, yet sturdy structure we call our body!

SKY: Thank you, Mr. Cossell, but I didn't hear anything you said after "Congratulations." All I can hear is whop, whop, whop, whop!

CURTAIN FINALE

Ever since the advent of heavier-than-air flight and rotary wing flight three decades later, there has been a certain problem involved with aircraft. In case you haven't already guessed it, the problem is NOISE and noise-induced hearing loss. The hearing

explosions, sheet metal punches, etc.

To aid in preventing noise-induced hearing loss, the Department of the Army (DA) has a massive education program underway on noise and hearing conservation which applies to DA civilians as well as to military. In accordance with DA Circular 40-9, "Command Emphasis on Hearing Conservation Programs," dated 24 April 1974, installation and unit commanders are responsible for organizing effective conservation programs with the assistance of their medical staffs and must stress the use and capabilities of protective hearing devices. The essential features of such programs are contained in applicable portions of AR 40-5, "Preventive Medicine," dated 13 March 1969, and TB Med 251, "Noise and Conservation of Hearing," dated 7 March 1972.

In addition, DA is attempting to weed out noise hazards in existing equipment and to develop equipment with lower noise levels. But the fact is that the noise problem is still with us and, until it is solved, protective devices must be used to prevent hearing loss.

In spite of the fact that unit commanders are responsible for organizing effective hearing conservation programs, the ultimate responsibility for hearing conservation rests with every individual. This requires a personal involvement by all personnel to aid in the implementation of hearing conservation methods when appropriate.

The Surgeon General has established 85 decibels (dBA) as the maximum permissible steady-state noise level for continuous exposure. As a general rule, hearing protection should be used whenever face-to-face voice communication becomes difficult in the presence of steady-state noise. The maximum permissible impulse noise exposure without protection is 140 dB peak intensity. However, hearing protection should be considered in the presence of any impulse-type noise.

The overall noise levels in Army aircraft generally exceed 100 dBA as shown in table 1. Therefore, aircrewmembers and ground-support personnel must use the protective devices discussed below to

While The Rotor's Running"

loss from which Mr. Wright and Mr. Sikorsky were suffering was temporary in nature and probably disappeared in an hour or two. However, after logging 500 or 1,000 hours in their respective inventions, the hearing loss *may* have become permanent!

Uncle Sam was aware of this problem and, since a deaf aviator is about as much good as a lame infantryman, he spent a lot of time and money developing protective equipment like the SPH-4 helmet. This pretty well takes care of the full-time fly guys, but what about the land-bound wrench-benders and occasional passengers?

Well, Uncle took the time to develop some goodies for them and also gave national stock numbers to some civilian-type gear to take care of those who'd druther walk. One thing to remember is, if two or three hours of flying time can wreak havoc on the pilot's ears, what happens to the guy who is exposed for 8-plus hours a day, 5 days a week on the flight line? You figure that one out. As for the passengers, well, here the temporary loss like Wilbur's and Igor's is usually the problem.

Congratulations to the commander who ordered his men to use earplugs when they were airlifted to try to free POWs in Vietnam. Once on the ground they could take out the plugs and hear every little rustle in the bushes. That's only one example, but others should be obvious.

Our main concern right now is the permanent hearing loss from day-in, day-out noise, so let's see what we've got, OK? Ear protection comes in two main types, in the ear (plugs) or over the ear (muffs). New information says that everyone in the Army should possess and maintain a personal pair of earplugs. Betcha didn't know that, huh? Plugs should be fitted by medically trained personnel, so don't go looking for them in your supply room. Even if they are there, you're not the one to fit them unless you're a properly trained medic.

Disposable earplugs are pretty handy to have around the operations desk where they can be given out to passengers who forgot their own. On the flight line itself, muffs are about the best thing going. They don't have to be fitted, are a little harder to lose, and are easier to put on and take off, especially if done frequently.

Some protective devices fit some heads better than others, so it's a good idea to try a couple of different types to find the best device for the person. When working around turbines it's best to wear both plugs and muffs. This gives the added protection needed in areas where noise isn't only loud but painful!

Lastly, no ear protector made works if it's sitting in its case or hanging on your belt. They'll only protect if they are worn, so who wants to be deaf? WEAR YOUR EAR PROTECTORS!

prevent hearing impairment or loss. Contrary to popular belief, hearing protectors do not impair speech communication in the presence of high noise levels. In some cases speech can be heard more clearly under these conditions. See table 2 for the sound attenuation characteristics of some of the protective devices available through the federal supply system.

There are a variety of hearing protective devices designed to be used in different situations.

The two basic service-issued, reusable earplugs are the Army standard single flange (V-51R) and the triple flange. The single flange is available in five sizes and the triple flange in three sizes. They fit different size ear canals; are made of soft, preformed vinyl; are intended for repeated use; and should be washed regularly to prevent danger of ear infection. All personnel should be issued two plugs and a plastic carrying case, which should be carried at all times.

All initial earplug fittings must be done under medical supervision to determine whether or not any condition exists that makes insertion inadvisable, such as a draining ear or blockage due to ear wax. Thereafter, ear canals should be rechecked at least once a year. If a plug is *not* properly fitted, inserted and seated as shown in figures 1 and 2, the amount of hearing protection is diminished. Earplugs have a tendency to work loose as a result of talking and chewing and need to be reseated periodically to prevent leakage. When the plugs are properly fitted and seated, the user's voice will sound lower and muffled to him as if he were talking inside a barrel.

Removal of the plugs is also important. If a plug is abruptly pulled straight out, an unpleasant or even painful suction can be exerted on the eardrum. A plug should be slowly and gently removed and the seal should be broken by twisting the plug or by straightening the canal, rather than pulling the plug straight out.

An earplug case should be provided at the same time the plugs are issued. It keeps the plugs clean and readily available when needed. The chain which keeps the lid and the case together is also used for attaching the case to the belt loops, button holes, etc.

Presently, there are three types of disposable earplugs in the federal supply system. One is a wax-impregnated cotton, the second is a polymeric foam (E-A-R plug) and the third is a silicone rubber type. They are useful for occasional short term exposure such as for aircraft passengers and troops or for someone who forgets his plugs, but should be discarded after the first or second use.

Of the three types, the polymeric foam has superior properties in terms of amount of attenuation, comfort, ease of maintaining a seal and immunity to extreme tempera-

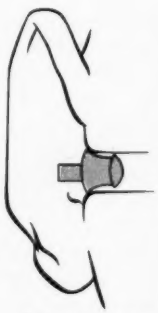
TABLE 1
Approximate Sound Pressure Levels of Selected U. S. Army Aircraft

AIRCRAFT	DECIBELS (dBA)*
AH-1	90-100
UH-1	92-98
OH-6	94-100
OH-58	90-101
CH-47	105-110
CH-54	98-105
OV-1	100-110
U-21	80-102

*Measured at pilot's position.

USAEHA

1. Make the ear canal accessible by reaching over head with opposite hand and pulling ear outward.
2. Grasp plug tab between thumb and forefinger and insert plug into ear canal.
3. Push and twist plug toward rear-center of head until seal is made.
4. If a good seal is not obtained, use smaller or larger size. Single flange plugs are available in five sizes—extra small, small, medium, large, and extra large.



Tab should be to the rear

FIGURE 1
Instructions for Inserting Single Flange Earplugs

USAEHA

1. Make the ear canal accessible by reaching over head with opposite hand and pulling ear outward.
2. Grasp plug firmly behind largest flange.
3. Insert smaller flange in ear canal. Push and twist toward rear-center of head.
4. If a good seal is not obtained, use smaller or larger size. Triple flange plugs are available in three sizes—large, regular, and small.

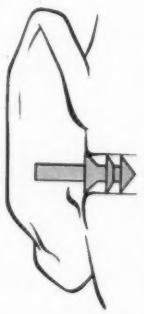


FIGURE 2
Instructions for Inserting Triple Flange Earplugs

tures. The silicone rubber type is the next best. The wax-impregnated cotton plugs are the least desirable because they melt or harden under extremes of heat and cold. (The old method of stuffing plain cotton in the ears has little protective value and is unsatisfactory.)

Several types of ear muffs are available which, when properly adjusted to head size and ears, provide adequate sound attenuation and comfort (figure 3). Muffs may be more convenient than plugs for use in some situations, such as for aviation ground-support personnel. It is important to keep in mind that a muff loses its effectiveness if the cushion does not seal around the ear. Long hair, eyeglass frames and caps should not be allowed to interfere with the seal of a muff.

Wearing earplugs and muffs in combination can provide slightly more protection than either device worn alone. But such a combination is only recommended when noise levels are such that additional attenuation is required.

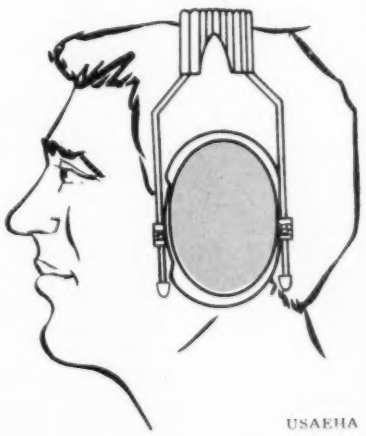
Also available is the universal earplug that fits all ears. This

TABLE 2
Sound Attenuation Characteristics of Hearing Protective Devices

Test Frequencies in Hertz	Mean Real Ear Sound Attenuation in Decibels						
	SPH-4 Helmet	Single-Flange Earplug (V-51R)	Triple Flange Earplug	Polymeric Foam Earplug (E-A-R)	Silicone Rubber Earplug	H-157 Communication Headset	Mine Safety, Mark II, Type I Earmuff
75	17.68	24.3	21.8	27.1	23.1	13.6	20.1
125	17.17	22.9	22.2	31.1	22.1	10.9	19.6
250	15.00	20.8	18.3	31.5	20.8	13.6	25.5
500	30.19	22.8	20.1	33.0	21.8	21.1	33.6
1000	28.62	25.0	21.0	33.4	24.7	31.4	39.2
2000	34.87	32.7	28.6	37.1	38.9	32.4	35.3
3000	41.94	33.7	34.1	42.2	42.7	31.8	38.8
4000	51.13	30.9	34.1	43.8	43.2	33.9	40.9
6000	48.34	27.9	36.7	43.7	41.1	20.8	35.5
8000	43.95	29.9	35.3	41.6	34.2	26.3	32.7

NOTE: The decibel mean attenuation of devices worn in combination is not cumulative, but is greater than a device worn alone.

1. Adjust headband to insure earcup seals are in complete contact with head.
2. Earcup seals must fit well around temples of eyeglasses.
3. When indicated, wear muffs in position specified on earcups.
4. When ear muffs are properly worn, your own voice should sound muffled to you as if talking inside a barrel.
5. Do not bend, alter or modify any part of headband, cups, cup lining or earcup seals.
6. Replace earcup seals that have become hardened, damaged or otherwise unserviceable.
7. Even a small leak eliminates the protection provided by ear muffs.



USAEHA

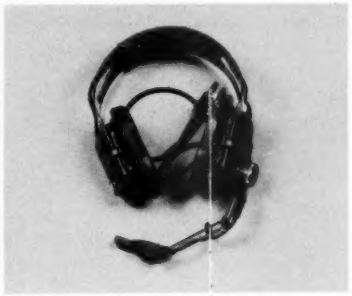
FIGURE 3
General Information on Ear Muffs

plug is held in place with a headband which adjusts to fit any head size. However, this device is recommended only for very short-term exposures or in cases when ear muffs may be too warm and bulky, as it tends to be very uncomfortable even during short periods of use. When this device is used, it should be washed with hand soap or mild detergent. The headband should then be relubricated with two drops of mineral oil so it can be easily adjusted.

Special type hearing protectors are available for aviators, including the SPH-4 flight helmet and various headsets. When properly fitted, the SPH-4 helmet combines excellent hearing protection with impact protection. To provide the noise attenuation designed into this helmet, it must be properly maintained with special attention given to the vinyl earcup seals (pads). The seals originally issued with the helmet tend to harden and must be replaced periodically.

The H-157/AIC microphone type headset is an adopted item of issue. In accordance with paragraph 3-29, section IV, AR 95-1, dated 18 October 1973, the headset can be worn by crewmembers of multiengine fixed wing aircraft other than the OV-1. However, the U. S. Army Agency for Aviation Safety (USAAAVS) and the U. S. Army Aeromedical Research Laboratory (USAARL) *recommend* the use of the SPH-4 helmet in all aircraft as mishap data reveal that fatal head injuries have been sustained by crewmembers of multiengine fixed wing aircraft who were wearing these headsets. As mentioned earlier, the helmet provides maximum protection during a mishap and greater noise attenuation, particularly in the 3000 to 8000 Hertz range.

The nomenclatures and national stock numbers for procuring protective devices are contained in tables 3 and 4. Note that earplugs



Aural protector, type I with microphone type headset, H-157/ AIC, NSN 5965-00-755-4656, is available but not recommended as the headset provides no impact protection

TABLE 3

Nomenclatures and National Stock Numbers for Ordering Ear Muffs, Helmets and Earcup Seals

EAR MUFFS From Common Table of Allowances (CTA 50-970, Expendable Items, 1 July 1974; Supply Catalog 4230/40-IL, Safety and Rescue Equipment, 7 Changes, 2 August 1971; and the Army Master Data File (AMDF)*	
AURAL PROTECTOR, SOUND, TYPE I	NSN 4240-00-691-5617 (C4230/40, page 41; CTA 50-970, page II-5) Designed to be worn with the suspension system over the head.
	NSN 4240-00-759-3290 (AMDF)
AURAL PROTECTOR, SOUND, TYPE II	NSN 4240-00-022-2946 (AMDF) Designed to be worn with the suspension system over the head, back of the head, or under the chin.
AURAL PROTECTOR, SOUND, TYPE I (WITH COMMUNICATION HEADSET)	NSN 5965-00-168-9624 (AMDF) Model-David Clark 19LB-87, boom-mounted microphone, H-312/AIC.
	NSN 5965-00-226-7870 Model-David Clark mush-mouth microphone, H-133/AIC.
	NSN 5965-00-755-4656 Microphone Type Headset, H-157/AIC.
AVIATOR'S HELMET (SPH-4) From the Army Master Data File (AMDF) and Supply Bulletin 700-20, 31 July 1974, page 2-125	
HELMET, FLYING, PROTECTIVE, MODEL SPH-4	NSN 8415-00-144-4981 (regular size) (AMDF)
	NSN 8415-00-144-4985 (extra-large size) (AMDF)
EARCUP SEALS	
REPLACEMENT SEAL, AURAL PROTECTOR	NSN 4240-00-979-4040 (AMDF) For David Clark ear muffs only.
SEAL, PLAIN	NSN 8415-00-143-8577 (AMDF) For aviator's helmet (SPH-4) right and left side.

*Regardless of the NSN used, any of the Type I ear muffs listed in these references could be received.

are presently being color coded according to size. While these devices are not all panaceas, virtually all noise-induced hearing damage is preventable if these devices are fitted properly and worn regularly. And even if hearing already has been affected to some degree, these devices will aid in preventing further damage. Just remember—hearing protection is your responsibility too!

TABLE 4

Nomenclatures and National Stock Numbers (NSN's) for Earplugs and Earplug Cases From Federal Supply Catalog C-6515 IL, 1 January 1975, Medical and Surgical Instruments and Supplies

PREFORMED EARPLUGS	
PLUG, EAR, HEARING PROTECTION, SINGLE-FLANGE, 24s	NSN 6515-00-664-7858 (extra small)
	NSN 6515-00-422-4765 (extra small, white)
	NSN 6515-00-299-8290 (small)
	NSN 6515-00-467-0085 (small, green)
	NSN 6515-00-299-8289 (medium)
	NSN 6515-00-467-0089 (medium, international orange)
	NSN 6515-00-299-8288 (large)
	NSN 6515-00-442-4807 (large, blue)
	NSN 6515-00-664-7859 (extra large)
	NSN 6515-00-442-4813 (extra large, red)
PLUG, EAR, HEARING PROTECTION, TRIPLE-FLANGE, 24s	NSN 6515-00-082-2675 (regular)
	NSN 6515-00-442-4818 (regular, international orange)
	NSN 6515-00-082-2676 (small)
	NSN 6515-00-442-4821 (small, green)
	NSN 6515-00-495-3173 (large)
	NSN 6515-00-467-0092 (large, blue)
EARPLUG CASE	
CASE, EARPLUG, PLASTIC	NSN 6515-00-299-8287 (C-6515-IL, page 48) 1 3/4" high by 1 1/8" diameter with screw cap. Bead chain on cap for attaching to buttonhole or belt loop. Accommodates one pair of earplugs.
HAND-FORMED EARPLUGS	
PLUG, EAR, HEARING PROTECTION UNIVERSAL SIZE, 400s	NSN 6515-00-137-6345 200 pairs, each pair in paper container
PLUG, EAR, SILICONE RUBBER, HEARING PROTECTION, CYLINDRICAL, DISPOSABLE, 48s and 200s	*NSN 6515-00-135-2612 24 pairs, each in a plastic box
	*NSN 6515-00-133-5416 100 pairs sealed in a blister pack
PLUG, EAR, COTTON, IMPREGNATED, DISPOSABLE, 100s	NSN 6515-00-791-9092 50 pairs stored in bulk
PLUG, E-A-R HEARING PROTECTION, UNIVERSAL SIZE, FOAMED POLYMERIC, DISPOSABLE	NSN 6515-00-137-6345 200 pairs
EAR-CANAL CAPS	
PLUG, EAR, PLASTIC, HEARING PROTECTION, UNIVERSAL SIZE, SINGLE-FLANGE	NSN 6515-00-392-0726 (Willson Sound Band) Two plugs mounted on a metal adjustable headband enclosed in a plastic tube.
PLUG, EAR, RUBBER, HEARING PROTECTION, UNIVERSAL SIZE, SINGLE-FLANGE	NSN 6515-00-181-8058 (Sound Sentry) Two plugs mounted on a metal adjustable headband enclosed in a plastic tube.

*These plugs are identical; the only difference is in the quantity of issue.

USAASO Sez

The U. S. Army Aeronautical Services Office discusses

ATC Radios

We've been mouthing off about a new batch of radio equipment for Army control towers. These radios include the AN/GRT-21 (VHF), AN/GRT-22 (UHF) transmitters and the AN/GRR-23 (VHF), AN/GRR-24 (UHF) receivers. Their 10,000 hour mean-time-between-failure (MTBF) rating means we can put'em in a tower and expect a year's worth of service before a failure occurs. This sure beats the 300 hour MTBF our present radios give us. By using solid state circuitry, these radios are smaller, lighter and more efficient than those old war horses we've been using. In addition, they'll permit us to operate on 50 kilohertz channel spacing doubling our present number of channels and if necessary, they can be converted to 25 kilohertz spacing. Whew! All that means is that the ground TAC facilities are catching up with the radios installed in Army aircraft.

Enough of the technical stuff, the radios are here and here in force! This neat installation is located at Laguna Army Airfield, Yuma, AZ. The professional engineering and installation job was done by the U.S. Army Communications-Electronics Engineering Installation Agency.

Take a look around and you'll see installations like this worldwide. Some of the locations are Pentagon AHP; Bryant AAF, AK; Simmons AAF, Ft. Bragg, NC; Butts AAF, Ft. Carson, CO; Michael AAF, Dugway Proving Ground, UT; and Libby AAF, Ft. Huachuca, AZ.

The photo shows the new transmitters (AN/GRT-21, AN/GRT-22), receivers (AN/GRR-23, AN/GRR-24) and on the far left our new standard tape recorder

BROKEN WING AWARDS

BROKEN WING AWARDS for exceptional flying skill during inflight emergencies last February at the U.S. Army Aviation Center, Ft. Rucker, are presented to Captain Kurt A. Rhodehamel (center) and Chief Warrant Officer, CW2 Donald L. Coleman (right). Making the presentations is Major General William J. Maddox Jr., Aviation Center Commander. Captain Rhodehamel is a flight commander in the Aerial Gunnery Branch, and CW2 Coleman is a flight instructor for the Utility Branch, Department of Graduate Flight Training.

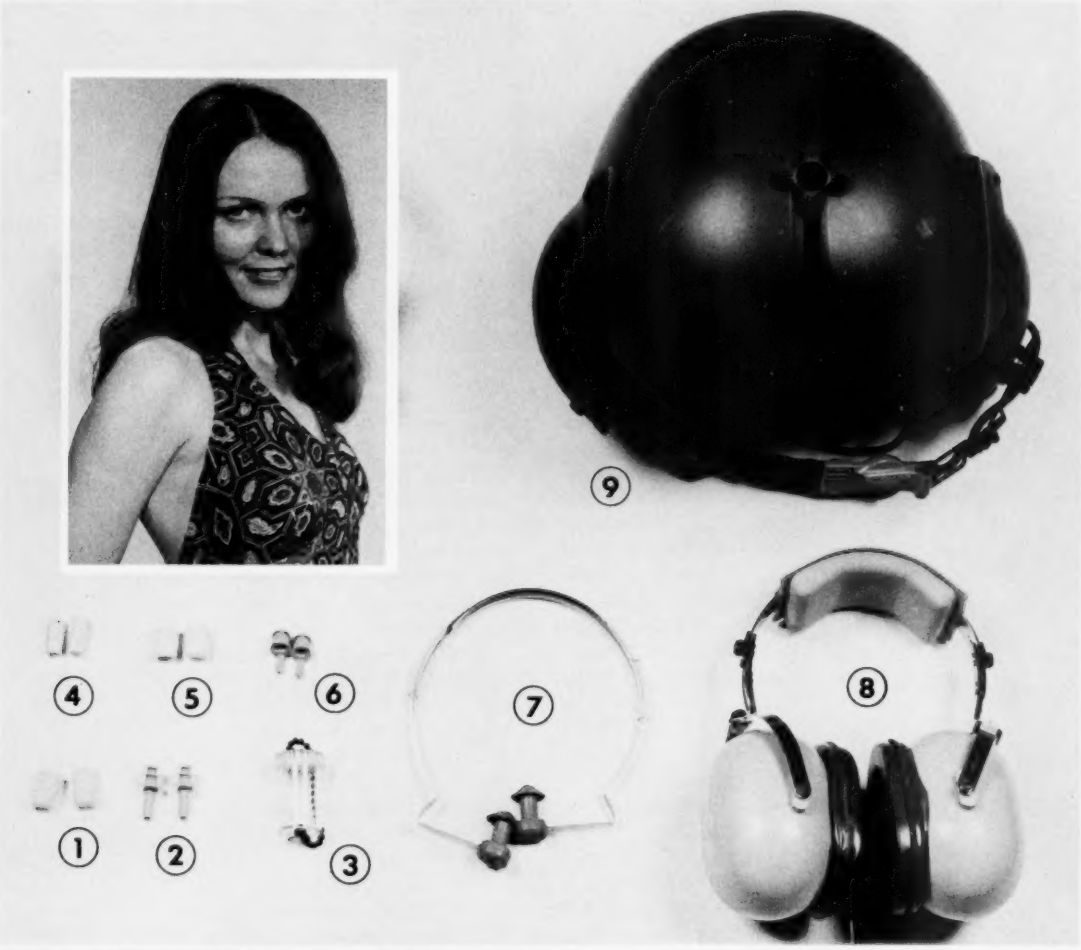
During a simulated forced landing by a student, the AH-1G HueyCobra helicopter engine failed. Captain Rhodehamel took control of the aircraft and made a successful landing in the only clear area nearby. He had to make a 180-degree turn and keep a six-foot tall tree in his touchdown path on the left side of the helicopter to prevent damage to the tail rotor. There were no injuries and the aircraft was not damaged.

CW2 Coleman took control of an OH-58 Kiowa helicopter which experienced engine failure during training of a student in emergency procedures. He noticed that his normal touchdown area contained several stumps and small trees. Skillfully adjusting airspeed and executing a precision autorotation, he landed the helicopter in a small clearing with no injuries or aircraft damage.

"SOUND" INTELLIGENCE

For a complete listing of National Stock Numbers and types of these protective hearing devices, see tables 3 and 4, pages 46 and 47, of the inside article entitled *"Sound" Intelligence*. These tables should be displayed on your safety bulletin board along with this back cover.

1. Plug, Ear, Cotton, Impregnated, Disposable, NSN 6515-00-791-9092
2. Plug, Ear, Hearing Protection, Triple-Flange, NSN 6515-00-082-2675 (regular)
3. Case, Earplug, Plastic, NSN 6515-00-299-8267
4. Plug, Ear, Silicone Rubber, Hearing Protection, Cylindrical, Disposable, NSN 6515-00-135-2612
5. Plug, E-A-R Hearing Protection, Universal Size, Foamed Polymeric, Disposable, NSN 6515-00-137-6345
6. Plug, Ear, Hearing Protection, Single-Flange, NSN 6515-00-299-8289 (medium)
7. Plug, Ear, Rubber, Hearing Protection, Universal Size, Single-Flange, NSN 6515-00-181-8058 (Sound Sentry)
8. Aural Protector, Sound, Type I, NSN 4240-00-691-5617
9. Helmet, Flying, Protective, Model SPH-4, NSN 8415-00-144-4981 (regular size)



This is the tenth of 12 back covers designed to show personal survival, rescue and protective equipment. Detach this cover for your bulletin board display of the more important survival and protective equipment available to crewmembers.

10 USAAAVS OF 12